THE ELECTRONIC CHECK-OUT PROGRAM:

A SCHOOL-BASED NOTE PROGRAM TO

IMPROVE ON-TASK BEHAVIOR

by

Virginia M. Ramos Matias

A dissertation submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

Department of Educational Psychology

The University of Utah

May 2017

The University of Utah Graduate School

STATEMENT OF DISSERTATION APPROVAL

The dissertation of **Virginia M. Ramos Matias**

has been approved by the following supervisory committee members:

William R. Jenson	, Chair	**12/9/2016** Date Approved
Elaine Clark	, Member	**12/9/2016** Date Approved
John L. Davis	, Member	**12/9/2016** Date Approved
Robert E. O'Neill	, Member	**12/9/2016** Date Approved
Julie Bowen	, Member	**12/9/2016** Date Approved

and by **Anne Cook**, Chair/Dean of

the Department/College/School of **Educational Psychology**

and by David B. Kieda, Dean of The Graduate School.

ABSTRACT

The purpose of this study was to validate the effectiveness of the Electronic Check-Out (ECO) Program in increasing students' on-task rates. The ECO Program was adapted from the check-in/check-out (CICO) intervention to be more time efficient by using an electronic form and having only a check-out session. This intervention included a unique motivational component at school and reduced parental involvement with reinforcement. The intervention was implemented for 4 to 5 weeks with a 1-week follow-up phase. Teachers used the ECO note in the general education classroom to monitor student behaviors during independent math work time and during the entire day.

To evaluate effectiveness, a multiple-baseline probe design was used among 5 3rd-grade participants. To determine effect sizes the improvement rate difference (IRD) and Tau-U coefficients were calculated. Teacher ratings on the ECO form were compared to in vivo on-task observation rates, and fidelity to intervention components were obtained. Teachers completed standardized behavioral rating scales pre- and postintervention, and teachers and students completed social validity ratings.

Results show that the ECO intervention program had clear and unequivocal large-to-very-large effects in 3 out of 5 participants' on-task behaviors (Tau-U = .96; IRD =.82), which remained significantly higher than baseline at the 1-week follow up (Tau-U = .69; IRD = .63). Four of the 5 participants displayed on-task rates that approximated those of classroom peers. Teacher ratings on the ECO form for all participants increased

for both the math block and the whole day as compared to baseline across all phases. Teacher 1 ratings on the ECO form correlated significantly to direct observation rates.

Participants demonstrated medium-to-large increases in math problem completion (Tau-U = .70; IRD = .62) and accuracy (Tau-U = .74; IRD = .63) during intervention and follow-up phases. The ECO intervention showed effect sizes comparable to those presented in typical CICO literature, with fewer components, using a unique and simple reward system, and consuming only half the time of the coordinator as a typical CICO. Teacher and student social-validity ratings were positive. Study limitations and future research areas are discussed.

TABLE OF CONTENTS

LIST OF TABLES

Tables

LIST OF FIGURES

Figures

LIST OF ACRONYMS

Acronyms

ADHD	Attention-deficit hyperactivity disorder
BASC-3	Behavior Assessment Scales for Children, 3rd edition
BASC-3-TF	Behavior Assessment Scales for Children, 3rd edition–Teacher Form
BASC-3 TRS	Behavior Assessment Scales for Children, 3rd edition, Teacher Rating Scale
BAU	Business as usual
BEP	Behavior education program
BIRS	Behavioral intervention rating scale
C&C	Check and Connect
CBM	Curriculum-based measurement
CCE	Check, Connect, and Expect program
CICO	Check-in/check-out
CIRS	Children's intervention rating scale
DBO	Direct behavioral observation
DBR	Direct behavioral rating
DBRC	Daily behavior report card
DLI	Dual language immersion program
DRC	Daily report card
EBD	Emotional and behavioral disability

EBI	Evidence-based intervention
ECO	Electronic Check-Out Program
e-DBRC	Electronic daily behavior report card
FBA	Functional behavioral assessment
GBG	Good Behavior Game
IEP	Individualized education program
IR	Improvement rate
IRD	Improvement rate difference
MCOMP	Mathematical computation curriculum-based measurement
MTSS	Multitiered system of support
ODR	Office discipline referral
PBIS	Positive Behavior Intervention and Support model
PND	Percentage of nonoverlapping data
SDO	Standardized direct observation
SIBS	Student Internalizing Behavior Screener
SLD	Specific learning disability
TDS	Teacher-directed student use of technology
WWC	What Works Clearinghouse

INTRODUCTION AND LITERATURE REVIEW

Active school engagement is a critical factor for academic success and an essential target for behavioral intervention (Wang & Eccles, 2013). The literature shows that behavioral interventions such as point systems, tracking programs, and contingency contracts have been used by teachers, as well as school psychologists, over decades to increase on-task behaviors, accurate task completion, school attendance, and social behaviors, and to decrease disruptive behaviors (Allen, 1993; Bowman-Perrott, Burke, de Marin, Zhang, & Davis, 2015; Ducharme & Shecter, 2011; Kern, Choutka, & Sokol, 2002; Murphy, 1988; Wolfe et al., 2015). In addition, off-task behaviors are among the most frequently targeted disruptive behaviors for intervention (Kern et al., 2002).

The term *on-task* refers to a student's ability to keep eye contact with the teacher during instruction or to keep his or her eyes on the given assignment (e.g., attend), and to perform the requested tasks (Jenson, Rhode, & Reavis, 2009). It has been proposed that an appropriate rate of on-task behavior within a general education classroom should be 85% of the time (Jenson, Rhode, & Reavis, 2009) in order for students to benefit from instruction. Students who experience academic or behavioral difficulties, however, are on-task less than 60% of the time (Jenson et al., 2009). On-task behaviors have been linked to positive academic, emotional, and social student outcomes (Ducharme & Shecter, 2011; Wang & Eccles, 2013). Comparatively, off-task and disruptive behaviors have been found to correlate with significant loss of instructional time (Battaglia, Radley,

& Ness, 2015; King, Radley, Jenson, Clark, & O'Neill, 2014; Knorr, 2015; Lopach, 2016).

Difficulty with on-task behavior is one of the most common reasons for referral for evaluation and office discipline (Polirstok & Gottlieb, 2006). A survey conducted by the Association of Teachers and Lecturers showed that challenging student behavior was a reason for teachers leaving the field (Marsh, 2015). Disruptive behaviors such as off-task behaviors lead to interferences in the instructional time for all students in the classroom (Goodwin, 2012; Kraemer, Davies, Arndt, & Hunley, 2012). Off-task behavior is a primary reason beginning teachers leave the job (Marsh, 2015; Provini, 2014; Strauss, 2015).

When teachers are trained in and supported with behavioral-management techniques at both the classroom and individual levels, referrals regarding disruptive and problematic behaviors decrease. Additionally, instructional time, teacher–student positive relationships, and positive views of the school increase when teachers are supported and have the training to work with challenging students (Polirstok & Gottlieb, 2006). Behavioral tracking systems that reward appropriate and positive classroom behaviors have been shown to be an efficient way to increase on-task behaviors, positive teacher–student relationships, and in turn, academic achievement (Bowman-Perrott et al., 2015; Bruhn, Lane, & Hirsch, 2014; Kern et al., 2002; Mitchell, Stormont, & Gage, 2011; Vannest, Davis, Davis, Mason, & Burke, 2010; Vannest, Harrison, Temple-Harvey, Ramsey, & Parker, 2011; Vannest, Payne, Davis, & Soares, 2011;Yong & Cheney, 2013).

Polirstok and Gottlieb (2006) stated, "Successful behavior management is a

critical prerequisite for successful academic instruction" (p. 359). Off-task behaviors are observed in students who have neurodevelopmental disorders such as attention-deficit hyperactivity disorder (ADHD) and typically developing children at risk of developing chronic disruptive behaviors. Many students are referred for or placed in special education or have a significant number of office-discipline referrals because they lack the prosocial and academically appropriate behaviors needed for success in school (Polirstok & Gottlieb, 2006). As school curriculum demands become increasingly difficult and the teaching pace accelerates, it is imperative that teachers and related service providers collaborate to increase appropriate classroom and school behaviors, such as on-task behaviors, within the multitiered system of supports (MTSS). School-based behavioral interventions, such as behavioral tracking systems, should strive to transition behavior "from a 'dysfunctional' to a 'functional' range of performance" before they become chronic enough to require specialized supports (Gresham, 2004, p. 337).

Within the school-wide positive behavioral and instructional support and the MTSS frameworks, behavioral interventions and reward systems are utilized to support students who are at risk for chronic behavioral difficulties (Tier 2), and students who have been identified as needing specialized behavioral supports (Tier 3). Secondary (Tier 2) interventions are those that target the 10% to 15% of students who are considered to be at risk for chronic behavioral difficulties, while Tier 3 interventions target students for whom intensive interventions are needed (Hagan-Burke et al., 2005). Secondary and tertiary interventions that have been shown to decrease disruptive behaviors and increase both time on task and academic achievement include the Daily Behavior Report Card (DBRC; Volpe & Fabiano, 2013) and its electronic version (e-DBRC); the Behavior

Education Program (BEP; Crone, Hawken, & Horner, 2010); the Check-in/Check-out Intervention (CICO) program; the Check and Connect Prevention Program (C&C; Evelo, Sinclair, Hurley, Christenson, & Thurlow, 1996); and the Check, Connect and Expect program (CCE; Cheney et al., 2009).

Problem Behaviors in the Classroom

Kottler and Kottler (2009) described disruptive behaviors such as attention problems and declines in academic progress as behaviors that drive teachers "crazy." According to the latest report by the National Center for Education Statistics on teacher attrition and mobility, 17% of beginning teachers who started in the 2007–08 school year were not teaching 5 years later (Gray, Taie, O'Rear, & U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences, 2015). Furthermore, about 80% of those teachers left their jobs voluntarily (Gray et al., 2015). In numbers, 17% represents 26,900 teachers who voluntarily and regardless of their degree status (i.e., bachelor's vs. master's) left their position after 5 years on the job. Behaviors that are inappropriate, disruptive, and/or completely absent from students' social, emotional, or behavioral repertoire take up teachers' mental, emotional, and physical energy and work time (Kottler & Kottler, 2009; Sun & Shek, 2012), which impacts their decision to quit.

Disruptive behaviors "inadvertently trap" teachers, peers, and parents in negative social interactions, and may trigger misbehavior in other students (Walker, Ramsey, & Gresham, 2004b). In the latest Digest of Education Statistics report, 38.5% of teachers (2011–12 school year) reported that student misbehavior interfered with teaching (Snyder, Dillow, & U.S. Department of Education, National Center for Education

Statistics, Institute of Education Sciences, 2015). Walker, Ramsey, and Gresham (2004a) stated that when evidence-based interventions are implemented, disruptive behavior decreases and teaching time for all children increases. Furthermore, the authors indicated that implementing well-researched interventions reduces staff time in dealing with misbehaviors and increases time for school staff to work on other needs, such as instruction.

Research presented in current education articles (e.g., Marsh, 2015; Provini, 2014; Strauss, 2015) list several reasons why teachers leave their jobs. The disruptive behavior of students, lack of training in classroom management, and lack of support from school districts are some of the reasons teachers report for leaving their job. They indicate that students' inappropriate and disruptive behaviors not only affect their own learning but also impact the learning of the rest of the students in the classroom (Goodwin, 2012; Snyder & Dillow, 2015). Furthermore, talking out of turn and inattention were reported by middle school teachers to be the "two most disruptive behaviors to teaching and learning" (Sun & Shek, 2012, p. 5).

Being On Task as a Keystone Behavior

As discussed, teachers consider on-task behaviors to be essential for the learning of the individual student and the classroom as a whole. On-task behavior is described as a learned behavior that can be increased by intervention(s) and changes in environmental factors (Ducharme & Shecter, 2011; Greenwood, Horton, & Utley, 2002; Wang & Eccles, 2013). On-task behaviors have been identified as one of four "keystone behaviors" that, when increased, lead to academic and social success at school (Ducharme & Shecter, 2011). Ducharme and Shecter defined a keystone behavior as a

required target behavior that serves as a foundation to the acquisition of other skills. The researchers theorized that on-task behavior is directly opposite to problematic behaviors within the classroom, and directly influences secondary behaviors such as academic responses, aggression, and academic achievement.

Evidence provided by Ducharme and Shecter (2011) shows that "keystone approaches can be a cost-effective strategy for improving classroom outcomes" (p. 269), but more data are needed. The keystone intervention model was shown to be effective in improving acquiescence (i.e., the ability to adapt to the needs of others) and other covariates (i.e., prosocial and cleanup behaviors) identified by Ducharme, Folino, and Derosie (2008) among students with antisocial behaviors. Targeting keystone behaviors can lead to improvements in the behavior targeted for intervention, and targeting secondary behaviors can make interventions more effective, efficient, and useful for teachers and school personnel. Training in targeted keystone-behavior interventions can be delivered by teachers, classroom aides, parents, and even school peers. Using the keystone intervention model may also decrease the need to utilize functional behavioral assessments and aversive procedures, such as punishments, to reduce serious problematic behaviors (Ducharme & Shecter, 2011).

Commonly Used Interventions to Improve Student Behaviors

Many teachers may rely on the use of aversive procedures to reduce problematic behaviors within their classrooms. Aversive procedures, such as punishment, are quick fixes that do not show long-lasting positive effects on behavior but can be delivered quickly by overwhelmed teachers looking for some relief. Furthermore, aversive procedures do not support a positive student–teacher relationship, which has been shown

to impact student outcomes. A positive relationship between adults and students has been deemed to be an "essential aspect . . . of a behavior change program and one of the most difficult and demanding aspects of any program" (Hunter-Carsch, Tiknaz, Cooper, & Sage, 2006a, p. 114).

Programs that provide positive, consistent, and continual interactions with school staff may increase student success and decrease teacher stress (Beaty-O'Ferrall, Green, & Hanna, 2010). Students who show disruptive behaviors may not know what is expected of them, may lack skills or the ability to perform certain behaviors, and may have a desire for attention, respect, and approval from adults in their environment (Hunter-Carsch et al, 2006a; Kottler & Kottler, 2009). Mentoring programs, effective praise and reinforcement, establishing clear goals and rules, and appropriate tiered interventions and supports are some of the strategies shown to be effective in increasing positive student–teacher relationships and thus influencing behavior (Beaty-O'Ferrall et al., 2010; Hunter-Carsch et al., 2006a; Kottler & Kottler, 2009; Sun & Shek, 2012). These are just some of the many data-based strategies that behavior-management and reinforcement programs such as the BEP, CICO, DBRC and C&C use to increase appropriate behaviors and academic achievement.

Classroom Behavior-Management Strategies

The ability and perceived skill of teachers to manage their classroom (i.e., classroom management self-efficacy) have been associated with decreases in emotional exhaustion and depersonalization and increases in personal accomplishments (Aloe, Amo, & Shanahan, 2014). Research showed that teachers who feel more efficacious in managing their classroom are less likely to leave their job (Aloe et al., 2014).

Establishing evidence-based, cost-effective, time-efficient, and appropriate-behavior classroom interventions is, therefore, critical to decreasing teacher burnout and establishing appropriate ways to identify students with behavioral difficulties who need more intensive support.

Research conducted over the past 30 years has shown that classroom management is rated as number one in terms of impact on student achievement (Marzano, 2003). Meta-analysis results on factors such as rules and procedures, disciplinary interventions, teacher–student relationships, and teacher mindset has also been shown to significantly decrease disruptive behaviors by an average of 32% (i.e., ES = -0.909; Marzano, 2003, pp. 8–9). Teachers who utilize classroom-management interventions effectively decrease disruption and increase student engagement (ES = .617, PR = +23 points) and achievement (ES = .521, PR = +23 points; Marzano, 2003, p. 10). Thus, classroom-management techniques that are implemented appropriately can significantly impact student and teacher outcomes (Oliver, Wehby, & Reschly, 2011).

Many individual and classroom behavior interventions and strategies have been found to be data-driven and effective in rigorously conducted meta-analyses and reviews. Strategies such as teacher-directed opportunities to respond have demonstrated significant decreases in off-task and disruptive behaviors (MacSuga-Gage & Simonsen, 2015). Token economies have been found to be effective classroom and individual interventions to increase appropriate behaviors and decrease disruptive behaviors (Maggin, Chafouleas, Goddard, & Johnson, 2011). School-based group contingency interventions such as the Good Behavior Game (GBG) have proven to be an effective strategy to decrease disruptive behaviors and increase instructional time and student

engagement (Maggin, Johnson, Chafouleas, Ruberto, & Berggren, 2012; Oliver et al., 2011). Programs that use antecedents, reinforcements, and consequence strategies within the classroom (e.g., GBG and the Classroom Organization and Management Program [COMP]) have also been shown to decrease disruptive behaviors (Oliver et al., 2011).

Behavioral interventions typically implemented within the schools often include some features of behavioral analysis, cognitive behavioral theory, social learning theory, and classical conditioning theory (Gresham, 2004). Contingency contracting, tracking interventions, and behavioral contracting systems, such as those mentioned above, have their origin in behavioral analysis (Murphy, 1988). Contingency contracting has been defined as an agreement between a student and one or more adults from whom the student receives highly desired reinforcers or consequences when they perform specific behaviors during specific activities (Murphy, 1988). Although reward and tracking systems have been discussed in the medical and mental health literature for more than 45 years (Bailey, Wolf, & Phillips, 1970, as cited in Bowman-Perrot et al., 2015), their application in the school setting was not seen in the literature until 35 years ago (Murphy, 1988). Reward systems are particularly advantageous because they allow for stakeholder input (e.g., students, teachers, and parents), increasing the chances of participant buy-in and program success. Tier 2 behavioral interventions can also be easily modified for individual students and can be cost effective when technology is incorporated.

When preparing reward systems within the school setting, Murphy (1988) recommends that teachers "negotiate instead of dictate, include only one or two specific, measurable behaviors, [create] explicit and concise written contracts, [and] utilize readily available, cost-free rewards" (pp. 264–266) when possible, shift to self-monitoring, and

evaluate progress consistently and continually. Interventions should be created in collaboration with the school team, parents, and students; should utilize achievable goals and behaviors that will increase the student's positive-behavior repertoire; and when appropriate, should fade toward self-monitoring. Behavioral contracts should include concise and clearly stated expectations, incorporate rewards and consequences, and be flexible enough to be easily modifiable for students' individual needs (Bowman-Perrot et al., 2015).

Behavioral Intervention as Tier 2 and Tier 3 Strategies

Behavioral contracting is part of antecedent interventions, which strive to change or manage problematic behavior "in a manner that is not likely to provoke or set the occasion for problem behavior to occur" (Kern et al., 2002, p. 114). Behavioral interventions such as contracts should be utilized as selected (Tier 2) or targeted (Tier 3) interventions within the schools (Gresham, 2004). Within the Positive Behavior Intervention and Support (PBIS) model, behavioral contracts can help modify behaviors of students who are at risk for serious behaviors, so they are more responsive to universal interventions (Gresham, 2004). Targeted interventions are extremely important in managing behaviors of the 1%–5% of students who are responsible for 50% of behavioral problems, and thus use up more than 50% of school and classroom resources (Gresham, 2004). Behavioral interventions, especially behavioral tracking contracts, can be effective level-2 and -3 interventions to reduce problematic student behavior and increase academic and prosocial skills.

Some critical features of Tier 2 interventions are systematic trainings, referral, and implementation procedures across staff, parents, and students. Selected interventions

are quick to implement and continually available, utilize the school's Tier 1 expectations, are monitored continually, are used for data-based decision making, and are easily modifiable (Hawken, Adolphson, MacLeod, & Schumann, 2009; Yong & Cheney, 2013). Studies have shown that Tier 2 interventions (such as BEP/CICO, C&C, Coping Power, Daily Progress Reports, and so forth) implemented with fidelity can significantly reduce problematic behaviors and increase academic engagement (Bruhn et al., 2014; Gresham, 2004; Mitchell et al., 2011; Yong & Cheney, 2013). Tier 2 interventions have been used to address inappropriate behaviors, lack of academic engagement or on-task behavior, poor academic skills, and to a smaller degree, poor social skills (Bruhn et al, 2014). Wolfe et al. (2015) have shown that effective interventions at the Tier 2 level provide early preventive support to students, thus decreasing the need for costlier (e.g., in professionals' time), intense interventions in the future.

Effectiveness of Behavioral Interventions in Decreasing Disruptive Behaviors

Stage and Quiroz (1997) showed that school interventions can reduce disruptive behaviors in the classroom by at least 78%. They included interventions in schools that used behavioral, cognitive-behavioral, individual-counseling, parent-training, and multimodal theories. The authors concluded that, although the data were not sufficient to study differences in effectiveness between interventions, the overall effect size indicates that interventions utilized in classroom settings are effective in reducing disruptive behavior. Stage and Quiroz also found that students treated in self-contained classrooms were more likely to show reductions in undesirable behaviors than students in general education classes.

In a more recent study, Bowman-Perrot et al. (2015) conducted a meta-analysis of single-case studies on school-based behavioral contracts. Results showed that the interventions were effective in reducing inappropriate behaviors, and increasing appropriate behaviors and positive academic outcomes. Effect sizes in the study ranged from .70 to .90 when comparing behavioral interventions to control groups or other methods such as psychodynamic or humanistic approaches, establishing behavioral interventions as efficient. Similar effects were found regardless of whether the intervention matched the behavior to a function (Gresham, 2004). Behavioral contracts utilized within the schools have shown moderate-to-large effect sizes (.27–1.00) in reducing disruptive behaviors (Bowman-Perrot et al., 2015). Furthermore, behavioral contracts have shown positive results with all grade levels, varying disability classifications (e.g., ADHD, specific learning disability [SLD], emotional and behavioral disability [EBD]), and "moderate effects on academic responses" (Bowman-Perrot at al., 2015, p. 262; Kern et al., 2002).

Daily Behavior Report Cards

Tier 2 interventions, such as the BEP, CICO, and DBRC, can be consider general behavioral contracting systems that use established school expectations as goals to be reinforced and increased through adult attention. The DBRC is used to provide frequent adult feedback to students about their behavior; it includes clear and objective definitions of behaviors, a rating scale for each behavior across one or more observation intervals, and a behavioral goal (Volpe & Fabiano, 2003). The DBRC is a form of parent–teacher collaboration because parents are encouraged to praise and reward their child's behavior contingent on them meeting goals. The authors explained that modifications and

additions can be made to the DBRC to include rewards or response-cost techniques. The DBRC has been successfully implemented with preschool students to decrease disruptive behaviors (LeBel, Chafouleas, Britner, & Simonsen, 2012), and more generally with elementary and middle school students to increase appropriate school behaviors and decrease disruptive behaviors (Lahey et al., 1977; Owens et al., 2012; Vannest, Burke, Sauber, Davis, & Davis, 2011; Vannest et al., 2010), including use of electronic versions (Burke, & Vannest, 2008; Vannest, Burke, Payne, Davis, & Soares, 2011).

Although many age ranges have been included in effectiveness studies of the DBRC, most data are collected utilizing elementary and secondary school students. LeBel et al. (2012) conducted an effectiveness study that primarily targeted the disruptive behaviors of preschool students. The researchers utilized a multiple baseline across 4 preschool students in two classrooms. Teachers rated the students using a Daily Report Card (DRC) three times per day. Results were shared with the students and their parents, and rewards and praise contingent on goals were provided. Visual analysis of direct observations for the 4 students showed a significantly large decrease in the intervals with disruptive behaviors, and this decrease was maintained after an 8-week follow up. LeBel et al. (2012) concluded that the DRC was effective in decreasing the problem behaviors of all 4 students.

The DBRC has also been recommended to monitor progress for individualized education program (IEP) goals for students with ADHD (Fabiano, Vujnovic, Naylor, Pariseau, & Robins, 2009; Fabiano et al., 2010). Fabiano et al. (2010) conducted a randomized clinical trial of the DBRC to monitor IEP goals for students diagnosed with ADHD that also have special education services in comparison to a “business-as-usual”

(BAU) control group. The BAU group did not include any of the components of the DBRC and had minimal contact with parents and teachers. The study included 63 children between 6 and 12 years of age (1st to 6th grades) who all had IEPs related to their ADHD diagnosis. Fabiano et al. (2010) concluded that the DBRC had positive and moderate effects on observed frequency of rule violations and teacher-reported improvement in IEP goals as compared to the BAU control condition; however, no significant differences between groups were found on formal measures of academic achievement, symptomatology, and student–teacher relationships (Fabiano et al., 2010).

A more recent study conducted by Owens et al. (2010) among elementary school students with ADHD or disruptive behaviors showed positive improvements in the children's targeted behaviors. In the study, the majority of children showed a large improvement (ES = .78) within the first month and every month after, up to the fourth month. Owens and colleagues concluded that the incremental benefit of the DBRC was actually a "double" increase, since the goals for students were raised as the goals were met. Overall, the authors reported that "72% of the sample had all of their target behaviors classified as improved and an additional 20% had at least one target behavior" improved (p. 857). Thus, the DBRC was shown to be effective across educational classifications, ages, trainers and teachers, genders, and targeted behaviors (Owens et al., 2012).

There is an extensive research base on the effectiveness of DBRCs, dating back to the 1970s (Vannest et al., 2010). In the most recent meta-analysis of single-subject-design studies investigating the effectiveness of the DBRC intervention, Vannest et al. (2010) found a mean effect size of 0.61. Results of the meta-analysis showed that the

DBRC intervention could be utilized with a range of ages, grade levels, and behaviors; however, there was significant variability and range between results (i.e., CI of -.15 to 0.97), leading the authors to conclude that there are moderator variables affecting results.

Vannest et al. (2010) examined moderator variables that may have impacted the results obtained by their research. The use of DBRCs throughout the day and with a high degree of parental involvement yielded better outcomes than interventions that did not have these components as strongly implemented. Studies that had low parental involvement had smaller effect sizes. Studies that included a rating scale with quantitative and qualitative anchors had better results than studies in which only a quantitative scale was used. Vannest et al. (2010) also concluded that a collaborative effort for reliability checks between school and outside personnel led to more positive results than school personnel only or researchers alone.

Behaviors that have been targeted for intervention with use of the DBRC were divided in three categories: disruptive behaviors only, on-task behaviors only, and a mixed group. The mixed group, which included both on-task and disruptive behaviors to be improved, had the most positive outcome, with an 80% improvement rate. The mixed-behavior group was followed by disruptive behavior alone (67% improvement) and on-task (52% improvement; Vannest, Burke, Sauber, et al., 2011; Vannest et al., 2010). Nonetheless, Vannest, Burke, Sauber, et al. (2011) concluded that on average, a rate of 59% to 68% of behavioral improvement should be expected.

The DBRC intervention has been found to be an effective school–home collaborative intervention to decrease disruptive behaviors. In the DBRC intervention, the teacher is in charge of the ratings, reviews with parents and students, and the provision of

contingent reinforcements; however, the CICO intervention makes use of other school personnel to increase students' positive interactions with adults, in addition to reward systems. These interventions have been particularly successful with students considered at risk for more chronic problem behaviors and that seek adult attention (Wolfe et al., 2015). CICO programs strive to decrease disruptive behavior and increase appropriate behaviors and academic engagement by having the student check with model adults at the school in addition to their teachers.

The Effectiveness of CICO Programs

The Behavior Education Program

The BEP (Crone, Horner, & Hawken, 2004; Crone, Hawken, & Horner, 2010; Hawken, 2006), a CICO intervention, is a selected (i.e., Tier 2) intervention that strives to support students identified as at risk for chronic problematic behavior, and who are not responding to Tier 1 behavior efforts. As such, the BEP CICO intervention can be utilized as a Tier 2 intervention, and when modified, as a Tier 3 intervention (Wolfe et al., 2015). The program can be implemented with relative ease within 3 to 5 days, and with a large number of teacher-referred students or with students presenting with a relatively high number of office discipline referrals (ODRs). The BEP eliminates negative antecedents by increasing positive teacher–student interactions and reminders of school expectations (Crone et al., 2010).

The BEP has several core features, including training of staff and teachers by the BEP coordinator before the start of services, a daily CICO with the BEP coordinator that utilizes a DRC with specific behaviors and expectations, continual feedback from teachers for every class period or section, a reward for goal attainment, consequences for

inappropriate behaviors, communication between the school team and parents, parent social reinforcement of goals at home, and daily and weekly monitoring for data-based decision making and progress monitoring (Crone et al., 2010; Hawken, 2006; Hawken & Johnston, 2007). The BEP reinforces the school's established rules and expectations with the use of a DRC that also includes spaces for teacher comments, daily goals, and ratings (Crone et al., 2010).

Many studies have evaluated the effectiveness and acceptability of the BEP in decreasing problematic behavior in elementary and middle school students, and others have provided modifications and some preliminary investigations for preschool populations. Preschool teachers and school personnel can implement PBIS Tier 1 strategies effectively **(**Benedict, Horner, & Squires, 2007), although function-based interventions can be successful at decreasing disruptive behaviors with children as young as 3 years of age (Duda, Dunlap, Fox, Lentini, & Clarke, 2004). There is lack of investigations of Tier 2 behavioral interventions conducted with preschool children; nonetheless, Steed (2011) successfully reduced a preschool student's disruptive behaviors within the classroom utilizing a modified BEP called the Thumbs Up Program.

There has been more extensive research conducted using the BEP with elementary and middle school populations. Hawken, MacLeod, and Rawlings (2007) conducted one of the first studies of the BEP implemented within an elementary school. The authors utilized a multiple-baseline design across small groups of students (i.e., four groups with 3 students each) to evaluate the effectiveness of the BEP in reducing ODRs. Besides following all of the guidelines for the BEP, students had a set goal of obtaining at least 80% of their daily points. Students utilized a spinner to receive small tangible

reinforcers, social or school-wide reinforcers, or a bonus to "move" on a sticker chart.

Hawken et al. (2007) showed that a large number of the participants (75%) had significant reductions in ODRs even when consistent parental involvement was low. Several of the participants who did not show significant decreases in ODRs were further found to be eligible for special education and/or in need of more intensive targeted behavioral supports. The results of the study by Hawken et al. (2007) "support previous research that the BEP can be implemented in a typical school setting by school personnel with a high degree of fidelity" (p. 98). Furthermore, the authors reported that the intervention was acceptable, easy to implement, and perceived by teachers to improve behavior.

McCurdy, Kunsch, and Reibstein (2007) demonstrated mixed results for the use of the BEP with 8 elementary school students. The authors reported that 50% of the students showed successful outcomes, but that 25% showed moderate results and 25% showed negative results. More detailed descriptions of the students with moderate or negative results indicated that problems at home and discontinuation of ADHD medication may have impacted the results, because the data showed decreasing patterns right after the onset of these events. As seen with other behavioral interventions, results for student behaviors are impacted by other variables, and interventions may not work for every student.

In a study of the effectiveness of the BEP, Hawken, O'Neill, and MacLeod (2011) investigated the functions of the students' behaviors; the authors showed that the BEP was successful in decreasing ODRs for the majority of the 17 elementary school students. Furthermore, improvements in ODR data for students whose primary motivation for

displaying behaviors were adult attention, peer attention, escape, and tangibles were observed. Moreover, the authors reported high acceptance levels by teachers, students, and parents who participated in the BEP intervention, and demonstrated that the BEP can be implemented in elementary schools, with high rates of fidelity, by traditional school personnel.

In addition to preschool and elementary school settings, the effectiveness of the BEP has been investigated with middle school students. Hawken and Horner (2003) studied the effectiveness of the BEP using a control group, with 4 middle school students displaying high rates of problematic behavior (e.g., talk outs, out of seat, not following directions, and so forth), and measured academic engagement as a secondary variable. Results indicated that teacher and student components were implemented with fidelity, but were not so implemented for parent components. Nevertheless, the authors reported decreases in problematic behaviors and increases in academic engagement for all students, and many of the students, teachers, and parents found the intervention to be acceptable. Similarly, Hawken (2006) investigated the use of the BEP as a Tier 2 intervention with middle school students, and showed that 70% of the students reduced their number of ODRs and, with the exception of parental involvement, all components were implemented with a high degree of fidelity.

Lane, Capizzi, Fisher, and Ennis (2007) investigated the use of functional behavioral assessments (FBAs) prior to the use of the BEP with 4 middle school students who were not responding to Tier 1 supports. FBA data showed that all behaviors of the 4 students were maintained by adult attention and escape from tasks. Students showed improvements in behavior even when subsequent criterion goals were changed as they

met their earlier goals. The authors recommended that more attainable goals should be used when variable data are observed to maintain the positive results.

The CICO Intervention

The CICO intervention follows the steps presented in the BEP for construction and implementation of the DRC and program components, and it is one of the most studied interventions to decrease inappropriate classroom behaviors and increase appropriate school and classroom behaviors. The CICO intervention has shown positive effects across grade levels and behaviors. There is a large body of research on the efficacy, effectiveness, and social validity of the CICO intervention to reduce problematic behaviors, increase positive academic and other behaviors (Hawken, Bundock, Kladis, O'Keeffe, & Barrett, 2014; Maggin, Zurheide, Pickett, & Baillie, 2015; Wolfe et al., 2015), increase social skills (Ross & Sabey, 2015), reduce internalizing behaviors and increase prosocial behaviors (Hunter, Chenier, & Gresham, 2014), and use peer mediators to support students at risk for internalizing disorders (Dart et al., 2014).

In an article on their large-scale study conducted with elementary school students, Filter et al. (2007) reported that 67% of the participants showed significant reductions in ODRs after undergoing the CICO intervention; the authors made use of school personnel to train and implement the CICO. Of the five components of fidelity of implementation measured by Filter et al., four were consistently implemented. The majority of the survey respondents indicated that the CICOs forms were completed, that the students took the cards to their teachers, and that the information gathered was utilized to inform student-support teams. Unfortunately, only a small number of respondents (41%) indicated that parents reliably initialed the DRCs; nonetheless, significant reductions in minor and

major ODRs combined and minor ODRs only were found for students participating in the CICO. The program was also perceived to be effective and efficient by school staff and teachers, and found to decrease ODRs.

Todd, Campbell, Meyer, and Horner (2008) conducted an efficacy study of the CICO intervention within a dual-immersion elementary school. Functional behavioral assessments were completed prior to the initiation of the intervention and established that adult attention was the primary function of problematic behaviors during instructional time. Furthermore, observations of 20-minute partial-interval problem behaviors (e.g., being off task, noncompliance, verbal interactions, and so forth) were utilized as dependent measures, conducted three to four times per week and completed during the same academic class each day. Overall, the study showed "an average of 17.5% reduction in problem behavior from mean baseline to mean CICO levels" (Todd et al., 2008, p. 52). ODRs decreased from 0.14 per day to 0.004 per day, and teachers reported that they found the program acceptable and easy to implement.

Many of the efficacy and effectiveness early investigations for the BEP/CICO relied only on the use of ODR data. ODRs have been found to correlate strongly with externalizing problems (i.e., index of Behavior Assessment Scales for Children–2nd edition; McIntosh, Campbell, Russell Carter, & Zumbo, 2009), and to be moderate indicators of student problem behaviors (Pas, Bradshaw, & Mitchell, 2011). Nonetheless, Sugai, Sprague, Horner, and Walker (2000) suggested that ODR data should be supplemented with other types of measures, and Wolfe et al. (2015) encouraged researchers to triangulate ODRs with different dependent measures of student behavior.

The study completed by Todd et al. (2008) is one of the early examples of CICO

investigations that utilized direct observational methods as dependent measures. Miller, Dufrene, Sterling, Olmi, and Bachmayer (2015) also performed direct behavioral observations to examine the impact of CICO on decreasing problem behaviors and increasing academic engagement, and obtained results similar to those of Campbell and Anderson (2011). Both studies showed that CICO is effective in reducing problematic behaviors and increasing academic engagement. Of importance is that both studies were recent attempts to fade CICO procedures and measure maintenance of results over time; however, results found by Campbell and Anderson (2011) and Miller, Dufrene, Sterling, et al. (2015) with regard to fading and maintenance were mixed.

There have been variations of CICO to reinforce social skills. Social-skills training was added to the CICO intervention to increase elementary school students' positive social engagement and decrease negative social engagement (Ross, & Sabey, 2015). Ross and Sabey (2015) found that the addition of social-skills training to the CICO intervention increased displays of positive social engagement and decreased negative social engagement on all 5 students in their study, and behaviors were maintained over time. The intervention was also rated as effective and efficient by teachers and mentors, and was implemented with high degrees of fidelity.

In a deviation from usual study populations, Hunter et al. (2014) utilized the CICO intervention with 4 elementary school students at risk for internalizing disorders. Participants were rated in behaviors such as participation in groups, asking for help, attention to task, and completing work. The researchers concluded that the CICO intervention was effective in reducing internalizing behaviors as measured by decreased scores on the Student Internalizing Behavior Screener (SIBS), and effective in increasing

prosocial behaviors as measured by their mean DRC scores. This intervention modified the CICO to include behaviors that were not part of the Tier 1 school rules, and although ratings of internalizing behavior decreased, the students' scores were still within the at-risk range. Nonetheless, teachers rated the intervention as highly acceptable.

Dart et al. (2014) implemented yet another change to the use of CICO for internalizing problems by including peers as mediators. In their study, 3 elementary school students received the CICO intervention components from 5th-grade students. The 5th-grade students received training and supervision from an intervention specialist. Results of the Dart et al. (2014) study showed decreased scores on the SIBS, which no longer reached the at-risk range. Results from the Daily Behavior Ratings (DBRs) forms completed by teachers showed moderate effect size for 2 of the students in increasing appropriate prosocial behaviors. Treatment acceptability ratings were obtained from the students receiving the intervention, peer mediators, the staff supervisor, and the teachers. Results indicate that all participants rated the peer mediated CICO intervention as "generally acceptable" (Dart et al., 2014, p. 240).

Hawken, Bundock, et al. (2015) reported results of a descriptive study of the CICO intervention with elementary and middle school students. Based on teacher DBR data, "84% of students earned at least 80% of their points" (p. 315). Furthermore, the majority of the 41 elementary schools and 13 middle schools included in the study reported 70% or more implementation fidelity. One remarkable result of the study was that participating schools were able to support 7% to 12% of their student population using the CICO intervention, which is aligned with Tier 2 interventions.

Turtura, Anderson, and Boyd (2014) and McDaniel and Bruhn (2015) conducted

further research on the effectiveness of the CICO intervention with middle school populations. Turtura et al. (2014) utilized an academic CICO to increase school and homework completion and decrease disruptive behaviors in 3 typically developing middle school students. The authors found that immediate off-task rate reductions were obtained when the CICO was implemented; teacher ratings increased for all 3 students; and social validity data showed that teachers, parents, and staff considered the intervention to be feasible and useful. McDaniel and Bruhn (2015), on the other hand, based their goal on average levels of DBRs obtained during baseline, to establish changing-criterion goals for 2 female middle school students with conduct problems. The study showed improved scores on the CICO and decreased classroom problem behavior, but social validity was not possible to obtain.

Due to the large research base on the CICO intervention, several meta-analyses and systematic reviews have been conducted. Hawken et al. (2014) reviewed the literature on the effectiveness of the CICO for students at risk for emotional and behavioral disorders. The authors found that across elementary and secondary schools, the CICO intervention had small effect sizes, with a median Cohen's *d* of .37, but large effect sizes for studies reporting R^2 with a median effect of .23. Furthermore, single-subject data calculations showed moderate effectiveness, with a median percentage of nonoverlapping data (PND) score of 68%. Overall, the authors concluded that the effectiveness of the CICO intervention in reducing problematic behaviors and increasing appropriate behaviors within the school setting is moderate.

In a systematic review of the CICO literature, Wolfe et al. (2015) showed that CICO is an evidence-based Tier 2 practice to reduce problematic behavior that is

primarily driven by adult attention. They stated,

> Six high-quality single-subject studies, with a total of 33 participants, conducted by five different research teams, in three different geographic locations, demonstrated experimental control of basic CICO on problem behavior. (p. 12)

The CICO intervention has been shown to reduce ODRs and problem behaviors, and to increase adaptive behaviors; however, the evidence on the use of the CICO intervention to increase appropriate behaviors is not conclusive (Wolfe et al., 2015). Furthermore, CICO data showed rapid changes in behaviors. Researchers who used the basic version of CICO observed positive changes within four to six sessions. Social validity data, which was primarily given by teachers and parents, indicated that CICO was perceived as acceptable and effective (Wolfe et al., 2015).

Maggin et al. (2015) also conducted a systematic evidence review of the CICO intervention to determine if the scientific base is sufficient to include the BEP as an evidence-based intervention (EBI), and to ascertain if the program has been used with fidelity; they utilized the What Works Clearinghouse (WWC) framework. Although fidelity to the majority of the core CICO components was reported as high, "parental signatures and check-outs were not implemented as consistently" (p. 9), and more research is needed to evaluate whether these components are crucial for intervention effectiveness. Overall, program-effectiveness results for the CICO intervention were mixed. Single-subject research data show sufficient evidence for CICO to be deemed an EBI, while group-based intervention data did not. The authors theorized that these group effects might be moderated by the functions of the students' behaviors being other than adult attention; however, they reported that a subset of studies demonstrated positive and significant results when the CICO intervention was modified to support escape-

maintained behaviors.

Modified BEP/CICO

Crone et al. (2010) recognized, recommended, and provided steps for modified versions of the BEP. When all members involved utilize the intervention with fidelity, data have been collected for 2–3 weeks, and the student has specific behavioral goals that have not been consistently met, the BEP/CICO could be modified for the individual student (Crone et al., 2010). Targeting specific functions and providing reinforcements can make these modifications specific to other functions besides attention, such as escape/avoidance, desired tangibles, peer attention, or even academic-related problems. The authors suggested the use of behavioral contracts and Functional Behavioral Assessments (FBAs) when modifying CICOs. They also suggested writing down the modifications being made and the reinforcers that can be provided for the specific student.

Some researchers in studies included in the systematic review by Wolfe et al. (2015) utilized modified versions of the CICO that included FBAs, among other changes. There were only five studies (5/15) that utilized "functionally matched reinforcer[s] contingent on meeting daily goal" (Wolfe et al., 2015, p. 10). Modified versions of the CICO showed positive results in decreasing problem behaviors, with Tau-Us ranging from .57 to .90; however, the authors concluded that more evidence of modified versions of the CICO are needed before it can be qualified as an evidence-based practice. In addition, more studies that include functions other than attention seeking from adults are needed, because results from previous studies are promising but not yet sufficiently robust.

Although the CICO intervention has been shown to be an effective Tier 2 intervention, there are some areas for needed improvement found within the CICO literature. Wolfe et al. (2015) showed that this intervention has primarily been used to significantly reduce problem behaviors, although only about 31% of the studies included in the review also measured appropriate behaviors. The authors encouraged more research on the impact of CICO on increasing appropriate behaviors, studies that include standardized measures of problem behaviors (e.g., Behavior Assessment Scales for Children [BASC]), and rigorous treatment fidelity components by school staff and parents. Furthermore, they urged that more research be conducted with modified versions of the CICO, especially those that target behaviors that are not primarily driven by adult attention, include set goals, and make use of contingent tangibles as rewards instead of praise only. Most importantly, Wolfe et al. recommended more studies that include CICO fading procedures and maintenance over time, since results on fading procedures have so far been mixed (Campbell & Anderson, 2011; Miller, Dufrene, Sterling, et al., 2015).

C&C Programs

Another example of a CICO intervention that has been utilized with elementary, middle, and high school students classified as at risk for behavioral difficulties and school dropout is the C&C intervention (Evelo, Sinclair, Hurley, Christenson, & Thurlow, 1996). This program was started in 1990 as a response to the call of the U.S. Department of Education, Office of Special Education Programs, to fund three dropout-prevention programs that included the school, the community, and the home. The C&C intervention has shown positive results in increasing school engagement and reducing truancy in elementary school students (Lehr, Sinclair, & Christianson, 2004), as an evidence-based

dropout-prevention and intervention program for middle and high school students (What Works Clearinghouse, 2015), and in increasing positive and significant changes in attendance and behavior for students with learning, emotional, and behavioral disabilities (Maynard, Kjellsrand, & Thompson, 2014; Sinclair, Christianson, Evelo, & Hurley, 1998; Sinclair, Christianson, & Thurlow, 2005; Sinclair, Thurlow, Christenson, & Evelo, 1995).

The C&C intervention procedures utilize risk-factor tables to monitor students' progress. For the "check" procedures, students who are referred for the intervention are assumed to be at risk and in need of the basic intervention; however, if students show increased risk in one or more indicators on the monitoring sheet, intensive interventions are implemented (Evelo et al., 1996). The monitoring sheet provides space for the nine risk factors to be monitored for a 1-month period. The "connect" procedures are those that integrate interventions and check-ins with the C&C monitor. The connect strategy has basic and intensive interventions. The intensive interventions are provided to those students who are at higher risk of dropping out, as indicated by the connect measures and results (Evelo et al., 1996).

All students referred for the C&C intervention receive the basic component, with those students identified as being at greater risk receiving all components of the basic procedures plus the intensive intervention. The basic intervention includes (a) explaining the C&C procedures to the students and parents; (b) giving students monthly or weekly feedback on their school progress, utilizing the monitoring sheet, and providing praise for school progress; (c) regularly discussing why being at school is important, including proven facts about staying at school; and (d) monthly problem-solving sessions to find

solutions for the risk indicators (Evelo et al., 1996). The intensive intervention includes the basic procedures, and in addition the monitor (a) finds tutoring peers or community programs to help students with low academic performance; (b) develops and implements academic and behavioral reward programs for completion of work, coming to school, and/or appropriate behaviors; (c) assists teachers in making accommodations within the classroom when needed; (d) provides social-skills training and facilitates family problem-solving sessions, if needed; and (e) facilitates youth involvement with after-school activity programs, summer jobs or programs, and community services.

In their seminal article on the effectiveness of the C&C intervention for the 1990–95 cohort of students, Sinclair et al. (1995) demonstrated positive effects for students classified as having a learning or behavioral disability. The authors reported decreases in out-of-school suspension as compared to the control group. Furthermore, "85% of youth with disabilities that received the intervention from grade 7 to 9 persisted in school" (p. 230), 9% had dropped out of school compared to 32% of the control group, and 68% were on track to graduate in 5 years as compared to only 29% of the control group. Thus, the researchers concluded that the C&C intervention should be implemented and monitored for an extended period of time.

In the WWC intervention report of 2015, the C&C intervention was reported to have positive effects on staying in school. There were only two studies that met the WWC criteria to be included in the analysis (Sinclair et al., 1998; Sinclair et al., 2005). These two studies concentrated on middle and high school students classified as having an EBD and/or a SLD. Both studies compared students to a peer comparison group. The report indicated that the C&C intervention showed "potentially positive results for

progressing in school" but "no discernable effects for completing school" (WWC, 2015, p. 2).

The WWC report (2011) indicates that there is not yet substantial evidence for the C&C to be classified as an EBI for students with emotional disturbances; nonetheless, Sinclair et al. (2005) showed positive longitudinal effects for students with emotional and behavioral disorders. Specifically, they found lower rates of dropout (ES = 0.58) and mobility (ES = 0.41), higher attendance (ES = 0.48) and school completion (ES = 0.53), and more comprehensive IEP transition plans as compared to peers at risk for dropout but not receiving the intervention. Furthermore, in a recent study by Maynard et al. (2014), a randomized block design comparing the C&C to a community-based dropout-prevention program was used to determine the effectiveness of the C&C intervention on attendance, behavior, and academic performance of 6th- to 12th-grade students. The majority of the students were of economically disadvantaged households and Hispanic ethnicity backgrounds. Study results indicate that students in the C&C group had better grades and fewer behavior referrals than the control group, but effect sizes for attendance were not significant.

The CCE Program

A modified version of the C&C is the CCE program, which integrates the essential components of the C&C and the BEP to reduce problem behaviors in elementary school students (Cheney et al., 2009). In the CCE intervention, students participate in (a) daily check-ins and -outs with a mentor, (b) multiple daily behavioral feedback by teachers using the daily report card, (c) problem-solving sessions with a mentor when a goal is not met, (d) daily charting of data and review of those data by the

mentor, and (e) contingent reinforcement (Cheney et al., 2009).

Using a randomized control trial to study the efficacy of the CCE, Cheney et al. (2009) found that when used with elementary school students with severe behavior problems, the intervention was effective for 60% of students who went through all the fading procedures until meeting the graduation criteria of self-management. Students who obtained the CCE over 2 years moved to the normal ranges on the problem-behavior scale of the Social Skills Rating Scale (SSRS), while the control groups remained within the clinically significant range. The researchers concluded that the CCE intervention is efficacious in reducing problem behaviors and referrals for special education, and may strengthen student social behaviors if social-skills sessions and problem-solving sessions are initiated when the student does not meet goals.

The Use of Electronic Forms as Part of Behavioral Interventions

Although Tier 2 interventions have shown promising results for students displaying disruptive behaviors, there are still many school districts that have not implemented a positive-behaviors-interventions-and-supports (PBIS) framework with all the tiers. Many interventions are not accepted or are hard to implement because of time, training, cost, and student behavior: “Teachers are reluctant to implement practices that take too much time, regardless of the promising results” (Royer, 2006, p.33). Recent national and state statistics show that elementary school class sizes in Utah have a median of 22–27 students within a classroom (Utah State Office of Education, 2013, 2015). This moderate number of students in inclusionary classrooms may impact the efficacy of teachers in implementing management techniques and tracking behavior effectively. In addition, elementary school students may have difficulty remembering to give their

tracking forms to teachers, and checking in and out with the service provider. Papers get "accidentally lost" on days in which ratings are poor or teachers forget to rate students. Interventions that are time, cost, and energy efficient and effective will be more likely to be accepted and utilized by teachers, school staff, and students, and implemented with more faithfulness. When implemented with fidelity, Tier 2 interventions will increase the time a student spends in the general education classroom, thus increasing the probability of appropriate student progress.

Students who present with disruptive and off-task behaviors may spend a critical amount of time outside of their general education classroom. Hunter-Carsch, Tiknaz, Cooper, and Sage (2006b) reported that as of 2000, students in the United States classified as EBD spend more than 60% of the time outside of their general education classroom. With as many as 80% of students coming to school without the social and behavioral skills needed to be successful (Sugai et al, 2000), having cost- and time-effective interventions that are evidence-based is of high priority. Teachers who instruct EBD students and teachers who have disruptive students in their classrooms are highly burdened and stressed due to required paperwork and a lack of administrative and parental support (Hunter-Carsch et al., 2006b).

Electronic systems are becoming more efficient, accessible, and available for teacher and students, however, which may ease some aspects of instruction. The use of technology has become a necessity within school systems, and is critical for everyday school activities; much state-wide testing and even topic-level testing is done using computers or tablets. A compelling image was created by Lee and Levins (2012). The authors explained that technology use is increasing to the point where not only will it be

used consistently, but instead of schools providing the technology, students will be asked or even required to provide their own. In their special-issue article, Collins and Halverson (2010) argued that although technology brings incredible opportunities for growth, it also brings about changes that can be viewed as challenges. As a consequence of the inevitability of technology use for the schooling process, teachers, parents, and other school personnel will be required to become skilled at integrating and competently using technology.

There are several strategies that can be implemented to increase teachers' use of technology in the classroom. Archer et al. (2014) explained that the effectiveness of information communication technology (ICT) interventions is significantly moderated by the support and training educators receive. As with any other intervention, when teachers are to implement some or all technology-based interventions, they will need training and support from the research staff or the service provider. In addition, Miranda and Russell (2012) indicated in their meta-analysis of teacher-directed, student use of technology (TDS) in elementary schools that the strongest predictors of TDS were teachers' experiences with technology, belief in the educational benefits of technology, and recognized importance of technology. The authors also found that teachers may not use technology if its integration appears to have obstacles within the classroom. Within the ECO Program, teachers will receive all of the training needed to utilize the electronic forms in their computers or tablets, and will receive support to troubleshoot any technology-related problems.

With the advancement of smaller, more efficient devices, developments in technology, and the variety of applications and Internet-based programs have also

increased. Two such programs are Google Docs and Google Drive, which have allowed users to create, manage, and share files privately and securely (Blood, 2011). Google Docs offers its users the opportunity to create Microsoft Word, PowerPoint, and Excel documents that are automatically saved to the drive, and can be edited and shared in real time. Furthermore, Google Docs has the Google Forms application, which allows users to create and manage forms and the data gathered from responders. Google Forms graphs data and can send email notifications with the data to several parties, can be easily accessed through a Web page, an icon on a desktop, or a home screen, and can be easily shared via links and through email.

The use of such programs for behavioral interventions has not been widely studied, although technology use continues to increase within the schools. Studies on the e-DBRC (Burke & Vannest, 2008; Vannest, Burke, Payne, et al., 2011) have shown effectiveness with little to no detriment. Burke and Vannest (2008) concluded that the use of the e-DBRC has the potential to serve as a "method for measuring response to intervention . . . and progress toward IEP goals . . . and increase teacher–parent collaboration" (p. 57). Vannest, Burke, Payne, et al. (2011) further stated that the use of the e-DBRC is an "effective intervention when combined with contingent reinforcement" (p. 48). While recent research studies (King et al., 2014; Knorr, 2015; Lopach, 2016) have made used of technology (e.g., Google Forms) successfully to increase students' on-task rates, studies with other forms of behavioral contracting using technology have not been forthcoming.

In accordance with the directive from the *No Child Left Behind Act of 2001* and the *Individuals With Disabilities Education Act* (2006) to decrease the amount of

paperwork for special education, technology-based behavioral interventions that use free and easy-to-access applications should be further analized for efficacy and effectiveness. Previous e-DBRC studies have made use of a university-developed program that has presets for behaviors, goals, and progress monitoring (Burke & Vannest, 2008). Conversely, with the use of programs such as Google Forms, the teacher or service provider implementing the contract can create his or her own system that is individualized for a particular class, group of students, or particular student. The use of electronic forms of behavioral interventions may decrease teacher planning and progress-monitoring time and collaboration with parents and service providers, and can streamline the use of data for parent conferences, IEP goals, and data-based decision making.

Implementation, the ECO, and the 11-Point Rating Scale

On-task behavior has been identified as a keystone behavior that, when changed, leads to positive academic and prosocial outcomes (Ducharme & Shecter, 2011). Similarly, teachers most often report students being off task as the most problematic behavior within their classroom (Bowen, Jenson, & Clark, 2004). Teachers also indicate that being off task negatively impacts a student's—and a class of students' as a whole—ability to learn when the student is also presenting with more disruptive and problematic behaviors (Sun & Shek, 2012). The use of behavioral tracking interventions, such as the CICO intervention, electronic home notes, and BRCs, has been shown to increase on-task rates and decrease problematic behaviors. Social validity data on these interventions shows that they are valued and accepted by teachers, parents, and to some degree, students. However, with the increased use of technology in the educational system, it is imperative that more data on effectiveness be gathered on the use of such technology to

improve students' behavioral outcomes.

When utilizing paper versions of behavioral interventions, the responsibility of maintaining the tracking system rests in the hands of students. Many students often forget to ask their teachers to complete the form, lose the papers, intentionally dispose of the document when the ratings are not desirable, refuse to deliver the note (Volpe & Fabiano, 2013), or forge the ratings on the form (Jenson & Reavis, 1996). With the use of an electronic version of the check-out, teachers can easily access the form, and results are immediately graphed and the data gathered in a table format. These critical features remove the responsibility from the student while maintaining the core features of the intervention, and provide the student with a graphed visual of his or her progress.

The ECO intervention utilizes evidence-based strategies (e.g., a "Mystery Motivator," teacher training, objective behaviors to be monitored, qualitative and quantitative ratings, and so forth) to increase a keystone behavior while streamlining the behavioral contracting intervention for ease of use, and improving cost effectiveness by using technology. The ECO intervention utilizes an Internet-based form in Google Forms, which automatically gathers, graphs, organizes, and sends the data to multiple parties, which helps to decrease the amount of provider, teacher, and student time spent implementing the intervention successfully. In addition, the ECO intervention makes use of a variable schedule of reinforcement (Skinner, 1974); however, this intervention has yet to be evaluated.

Some scholars (Maggin et al., 2015; Wolfe et al., 2015) have shown positive effects for the CICO intervention, while others have shown effectiveness in the use of an electronic version of home notes (King et al., 2014; Knorr, 2015; Lopach, 2016; Vannest,

Burke, Payne, et al., 2011; Vannest, et al., 2010). Miller, Dufrene, Olmi, Tingstrom, and Filee (2015) reduced the amount of teacher contact and added a motivational component which resulted in positive effects; Lahey et al. (1977) successfully implemented a DRC with minimal teacher and parent contacts; and Hawken et al. (2007) reported low rates of parent involvement with students still meeting their daily CICO goals. The ECO intervention provides the teacher and service provider a means to support and reward students for increases in being on task and other behaviors without the need for consistent and appropriate follow through at home.

Other factors that are included and new to the ECO intervention include social validity ratings by students, standardized videos, and the use of systematic direct observations in addition to DBRs. Although acceptability of interventions by teachers and parents has been shown to be positive (Wolfe et al., 2015), more input from the students is needed. While some of the procedures when establishing the BEP included utilizing videos to train teachers and observers on on-task behaviors, none of the studies to date have utilized standardized training videos, and just a few (King et al., 2014; Knorr, 2015; Lopach, 2016) have utilized standardized observations to analyze teacher accuracy of ratings by comparing the Standardized Direct Observation (SDO) with the DBR.

School psychologists frequently use SDO when assessing students referred for social/behavioral/emotional problems within the schools (Shapiro & Heick, 2004). SDO refers to the observation of an operationally defined behavior under objective and standardized procedures and conducted in specially selected times and places (Hintze & Matthews, 2004). Furthermore, scoring and summarizing procedures are systematic and do not vary by observers (Hintze & Mathews, 2004). Briesch, Chafouleas, and Riley-

Tillman (2010) reported that "at least 3–5 observations within or across days may be needed to obtain a dependable estimate of engagement" (p. 416).

Thus, SDOs are a valid method for obtaining rates of on-task behavior relatively quickly and reliably. The SDO utilized in this and previous investigations (King et al., 2014; Knorr, 2015) comes from *The Tough Kid Tool Box* (Jenson et al., 2009). This observation form includes operational definitions of on-task and off-task behaviors. It is set to last 15 minutes at 10-second intervals and provides the opportunity to compare the target student's behavior with that of a same-gender peer during the same period of time. Nonetheless, results on the reliability of SDO and teacher DBRs indicate that there is a moderate association between teacher ratings and observational data regardless of teacher training or the severity of behavior (Chafouleas, McDougal, Riley-Tillman, Panahon, & Hilt, 2005).

In the current study, and as recommended by Briesch et al. (2010), DBRs were included as part of the dependent measures and intervention package. Briesch et al. utilized generalizability theory to investigate the psychometric benefits of the use of SDOs, and DBRs of academic engagement to inform decisions of initial identification and monitoring of behavior. Direct behavioral ratings for the Briesch et al. (2010) study were obtained for one behavior (i.e., academic engagement) for every observational period. The DBR form consisted of ratings labeled from 0% to 100%, and the words *never*, *sometimes*, and *always*.

Briesch et al. (2010) concluded that both methods are equally beneficial in monitoring academic engagement but are sensitive to different types of variances. SDOs are influenced by differences in student behavior across days, whereas DBRs are more

sensitive to teacher rating effects (Chafouleas et al., 2005; Chafouleas, Riley-Tillman, Sassu, LaFrance, & Patwa, 2007); however, Briesch et al. indicated that both forms can and should be used in informing school-based decisions for initial identification and monitoring. When trained staff conduct observations, utilizing three SDOs is as effective as receiving 20 DBRs from teachers; however, DBRs are less intrusive and can collect information on teacher perceptions of behaviors for more class periods and over longer periods of time (Briesch et al., 2010).

Other researched-based strategies included in the ECO Program are teacher training and contingent reinforcement. As previously noted, training teachers and students in the use of the electronic forms is an essential part of behavioral tracking interventions, and may increase the probability of intervention acceptance. Furthermore, all of the interventions reviewed in this study utilized contingent reinforcement by way of praise, adult attention, and/or tangibles to enhance intervention outcomes. The ECO Program includes a very unique reward system contingent on students meeting their 70% or above goal of teacher ratings. Reinforcements have also been found to support academic progress. For example, in a study to increase math fluency for 4 elementary school students, Gilberston, Witt, Duhon, and Dufrene (2008) found that providing just reinforcement for completing instructional-level math computation worksheets increased the students' scores and on-task rates when instructional support was added to the reward.

Fidelity of implementation by teacher and investigator was measured, as well as social validity data from students and teachers. Studies on the BEP, DBRC, and CICO have consistently revealed that parents have the lowest fidelity-to-implantation scores due to many factors outside of the school environment. Thus, in this study the ECO form did

not include a parent component, but systematically and consistently measured the fidelity of implementation of teachers and the implementer. Furthermore, the acceptance of the intervention by students was regularly assessed for enjoyment, and the students and teachers also completed intervention rating scales for study acceptance at the end of the program.

Purpose of the Study

The purposes of this study were to (a) validate the effectiveness of the ECO Program, (b) investigate whether using only a check-out system is as effective as a typical CICO, which takes twice as much time, and (c) include a motivational system for the check-out intervention. In contrast to a regular CICO intervention, the ECO Program does not have a home reward component, will require at least 50% less time because it does not have a check-in session, requires little time from teachers and students and few school resources because it uses an electronic tracking card, and adds a reward system at school to motivate students to increase their time on task. Additionally, as presented in the keystone intervention model, the study strove to measure change in an optional teacher-selected behavior that, although tracked, was not directly reinforced by the ECO intervention. The participants were five 3rd-grade students in a Spanish, dual-immersion elementary school. The intervention utilized standardized training videos to train teachers in observing on-task behavior, and evaluated the agreement between teacher on-task ratings and observational data. This study also gathered information about the acceptability of treatment by teacher and students and treatment fidelity by teachers and the researcher.

METHODS

Research Questions

The research questions for this study were as follows:

1. Will rates of on-task behavior for participants be higher during math time than baseline on-task rates after receiving the ECO intervention as measured through direct observation in the classroom?
    a. Response discrepancy observation of on-task behavior form
2. Will rates of on-task behavior of participants be maintained at a 1-week follow up as measured by direct observation after receiving the ECO intervention?
    a. Response discrepancy observation of on-task behavior form
3. Will effect sizes for the ECO Program be comparable to those of the standard CICO intervention?
    a. Response discrepancy observation of on-task behavior form
        i. IRD
        ii. Tau-U
4. Will participants' rates of on-task behavior after receiving the ECO intervention be similar to those of their classroom peers who have not received the intervention?
    a. Response discrepancy observation of on-task behavior form
5. Will teacher ratings of participants' on-task behavior for math time on the ECO form increase over time?
    a. Teacher ECO form
6. Will teacher ratings of participants' on-task behavior for the whole day on the ECO form increase over time?

    a. Teacher ECO form

7. Will teacher ratings of participants' optional behavior for the math period increase on the ECO form over time?

    a. Teacher ECO form

8. Will teacher ratings of participants' optional behavior for the whole day increase on the ECO form over time, even when it is not directly reinforced?

    a. Teacher ECO form

9. Will teacher ratings of participants' behaviors on the Attention Problems, Hyperactivity, and Learning Problems scales of the Behavior Assessment Scale for Children, 3rd edition (BASC-3), be significantly different from and lower then baseline ratings after the implementation of the ECO intervention?

    a. Behavior Assessment Scale for Children , 3rd edition, Teacher Form (BASC-3-TF)

10. Will students' number of problems completed on individualized curriculum-based math worksheets be higher than baseline problem completion after receiving the ECO intervention?

    a. Curriculum-based measures (CBM) grade-level math worksheet

11. Will students' number of problems completed correctly on individualized curriculum-based math worksheets be higher than baseline problem completion after receiving the ECO intervention?

    a. Curriculum-based measures (CBM) grade-level math worksheet

12. Will teachers' ratings of on-task behaviors during the independent math seatwork time on the ECO form correlate with on-task rates as measured by direct observations?

    a. Response discrepancy observation of on-task behavior form

    b. Teacher ECO form

13. Will the average duration of check-out sessions and reinforcement sessions be 50% or less of the minutes recommended in the CICO literature?

    a. Duration, in minutes, of check-out sessions, as measured by a stopwatch

14. Will teachers maintain a high rate of fidelity-of-intervention-implementation as measured by the percentage of ECO completed within a week?

    a. Percentage of ECO form completed per week/week days

15. Will teachers report positive social-validity ratings about the ECO intervention on the Behavioral Intervention Rating Scale (BIRS), as measured by mean responses on a six-point Likert scale?

    a. BIRS teacher form

16. Will student participants report positive social-validity ratings on the modified Children's Intervention Rating Scale (CIRS) regarding participation in the intervention, as measured by mean responses on a six-point Likert scale?

    a. CIRS

17. Will participants indicate that the office reinforcement sessions they take part in are enjoyable and beneficial to them, as measured by their mean responses on the Fun 'O' Meter?

    a. Fun 'O' Meter

Research Site

Prior to the initiation of any research procedures, written institutional review board approval was sought and obtained from the participating university and the school district where the research took place.

The study was conducted in one elementary school located in the intermountain west of the United States. The school had 591 enrolled students as of March 2016, of whom 83.08% were White; 22% came from a low-income household. The school participated in a Spanish–English one-way dual language immersion program (DLI) from 1st grade to 5th grade. It offered four sessions of half-day kindergarten and housed three special-education classrooms from 1st grade to 5th grade. The math curriculum for the dual immersion students from 1st to 3rd grade was primarily taught in Spanish, with a 20-minute review within the English class. For students in 4th and 5th grade, the core math curriculum was taught in English, with a 20-minute review during the Spanish class.

More than 98% of the students in the DLI program at the school came from households in which English was the primary language; they received a half day of instruction in Spanish and a half day of instruction in English. The primary investigator was the full-time school psychologist at the school.

As part of the school's MTSS, teachers referred students to the Student Support Team for academic and behavioral interventions when the students were not responding to Tier 1 and/or Tier 2 interventions. Tier 2 interventions were offered in small groups for academic subjects. For behavioral problems, Tier 2 interventions were made with support from the school psychologist. Teachers could prepare their own systems or ask the psychologist for consultation; they could gather some of their data with the support of the school psychologist. In addition, teachers were encouraged to ask for support during their grade-level meetings with the principal and the school's achievement coach. The response team was composed of general education teachers, special education teachers, the school's achievement coach, the principal, and when needed, the school psychologist or other service providers.

The school psychologist's office served as the research room to conduct all orientation sessions and office reinforcement sessions. The office was equipped with a round table, chairs, a small couch, and a desk that accommodated the researcher, a graduate student assistant, participants, teachers, and parents. Teachers, parents, and participants viewed orientation components within the ECO Program on a MacBook Pro laptop computer with a 15-inch screen.

All observations were conducted in each English-only 3rd-grade classroom during their independent math work time. Participants 1, 2, and 3 were in Teacher 1's classroom;

this classroom had approximately 18 students, six of whom were female. Participants 4 and 5 were in Teacher 2's classroom, which had approximately 20 students, of whom approximately six were female.

Participants

Participants for the study were five 3rd-grade students referred by their teacher for on-task rates of less than 60% of the time, as determined by an on-task momentary time-sampling qualifying observation, compared to their classroom peers. Inclusion criteria were as follows:

1. Participants' primary language was English (1 student was bilingual).
2. Participants were in 3rd-grade general education classrooms.
3. Participants did not participate in the DLI program.
4. Participants did not receive special education services that included behavioral or psychological services.
5. Participants were nominated by their regular education teacher based on two criteria:
    a. Participants exhibited elevated rates of off-task behavior compared to their classroom peers.
    b. Participants had lower levels of math-problem completion and accuracy on math assignments compared to their classroom peers.
6. Participants had not been participating in a second Tier 2 or Tier 3 intervention for off-task behavior as implemented by the Student Support Team.
7. To qualify for the intervention and start the baseline process, all participants were on task during approximately 60% or fewer of the intervals observed on an initial one 15-minute systematic on-task observation in their classroom, and on average of the five baseline observations.

The 3rd-grade teachers who showed an interest in study participation were asked to help identify at least 2 or 3 students in their classrooms who displayed lower rates of

on-task behavior and math performance compared to their classroom peers. Parents of nominated participants were contacted to obtain permission to observe their child for possible study inclusion. Once written parental permission was received, the researcher and assistants conducted five, 15-minute direct-observation probes using momentary time sampling response discrepancy to confirm that the nominated participants met study inclusion criteria. The researcher asked each participating teacher to complete the BASC-3-TF to collect further behavioral information about each participant (Reynolds & Kamphaus, 2015).

Teacher 1 nominated four students and Teacher 2 nominated two students for study participation. One parent answered the recruitment email stating that she did not wish her child to participate in the study. All students had lower levels of problem completion and lower response accuracy on math assignments compared to their classroom peers. The 5 recruited participants obtained on-task rates of 60% or below on their first baseline 15-minute momentary time sampling systematic observation during the independent math time within their classroom, and their average across all five baseline observations was at or below 60%, except for Participant 1.

An assigned number refers to the 5 participants at the school research site. Study participants were 3 males and 2 females. One participant received itinerant speech/language services at the time of the study. Of the 5 participants, 4 students identified as White and 1 identified as Latino.

Participant 1 was a 3rd-grade Latino female who was proficient in both English and Spanish. Teacher ratings on the BASC-3-TF preintervention measure indicated clinically significant concerns for the Learning Problems Scale. Areas that fell within the

at-risk range were school problems and social skills. Participant 1 had an average of 65% time on task during the baseline phase.

Participant 2 was a 3rd-grade White male. Teacher ratings on the BASC-3-TF preintervention measure indicated clinically significant concerns in the areas of hyperactivity and attention problems. The area that fell within the at-risk range was school problems. Participant 2 had an average of 57% time on task during the baseline phase. He was diagnosed with ADHD–combined presentation, and received medication prior to the start of this study.

Participant 3 was a 3rd-grade White female. Teacher ratings on the BASC-3-TF preintervention measure did not indicate clinically significant concerns. Areas that fell within the at-risk range were anxiety, attention problems, learning problems, and school problems. Participant 3 had an average of 25% time on task during the baseline phase. She received itinerant speech and language services.

Participant 4 was a 3rd-grade White male. Teacher ratings on the BASC-3-TF preintervention measure indicated clinically significant concerns in the areas of hyperactivity, somatization, internalizing problems, learning problems, and school problems. Areas that fell within the at-risk range were conduct problems, anxiety, depression, attention problems, atypicality, and the Behavioral Symptom Index. Participant 4 had an average of 53% time on task during the baseline phase. He had a diagnosis of anxiety and had started medication treatment prior to study participation.

Participant 5 was a 3rd-grade White male. Teacher ratings on the BASC-3-TF preintervention measure indicated clinically significant concerns in the area of hyperactivity. Areas that fell within the at-risk range were externalizing problems,

attention problems, learning problems, school problems, atypicality, and the Behavioral Symptom Index. Participant 5 had an average of 33% time on task during the baseline phase. He had been diagnosed with ADHD and received medication prior to the start of this study.

Assessment and Dependent Measures

The primary dependent measure was participants' rates of on-task behavior as measured by systematic direct observation probes. In addition, academic performance was evaluated using participants' rates of problems completed correctly, number of problems completed correctly, and number of problems completed on curriculum-based math worksheets. The correlation between teacher ratings on the ECO note with results of systematic direct observation probes was also calculated. The percentage of teacher ratings received on the total ECO notes submitted was used to determine response consistency. Check-out and reinforcement session duration was recorded and averages were obtained to evaluate time spent with the student. Teacher, parent, and participant feedback on questionnaires and participant ratings on the Fun 'O' Meter were used to assess consumer satisfaction and social validity.

On-Task Behavior Rates With the Systematic Observation Form

The primary investigator and research assistants used systematic direct observations to gather on-task rates for each participant. These observations were conducted using a momentary time sampling approach. The observations took place in each participant's classroom during a period when the participants were required to complete independent math seatwork, where students worked independently at their

desks. The observers followed the behavioral observation format described in *The Tough Kid Tool Box: Practical Classroom Strategies* (Rhode, Jenson, & Reavis, 2010) for each systematic observation (see Appendix A). Each observation lasted 15 minutes and was divided into 90 10-second intervals (see Appendix A). The participants were observed along with a same-gender peer during each 10-second interval. A student was considered on task if he or she had been on task for the last second of the interval. The observer looked up at the 10-second interval vibration/sound and marked the student as being on task or off task using the codes provided below. A participant was counted as being off task only once during each interval. The behaviors that were observed and their corresponding codes were taken from *The Tough Kid Tool Box* (Rhode et al., 2010) and are as follows:

* = On-Task: Eye contact with teacher or task and performing the requested task.

T = Talking Out/Noise: Inappropriate verbalization or making sounds with object, mouth, or body.

O = Out of Seat: Student fully or partially out of assigned seat without teacher permission.

I = Inactive: Student not engaged with assigned task and passively waiting, sitting, etc.

N = Noncompliance: Breaking a classroom rule or not following teacher directions within 15 seconds.

P = Play with Object: Manipulating objects without teacher permission.

Rates of Math Problems Completed Correctly and Number of Problems Completed

Throughout the study, each participant was provided with individualized curriculum-based math worksheets generated from the Math Worksheet Generator (www.interventioncentral.org) at the student's grade level (see Appendix B), with no less

than 80 math computation problems. Each worksheet contained at least 80 individual math facts based on the student's current and future math curriculum. Participants utilized double-sided copies of the original probes. The primary researchers consulted with both teachers on what math facts were appropriate for each participant. Participants worked on these probes throughout the study and specifically during the independent math seatwork time.

The researcher provided probes to each participant's teacher before the participant entered the baseline phase of the study. Each classroom teacher gave the worksheets to the participant at the beginning of each 15-minute on-task observation. At the end of the 15-minute session, the classroom teacher immediately collected the worksheets. Teachers gave the researcher the completed worksheets immediately afterward or at the end of the day. Participants received new worksheets every day of the baseline, intervention, and follow-up phases. To make it possible to measure completion of problems and the proportion of problems completed correctly, teachers had the participants work exclusively on these worksheets during an established 15-minute daily time block throughout each phase of the study.

Teacher Response Consistency

Throughout the intervention phase, the researcher recorded the number of ECO forms received via email before the end of school day, indicating that the teacher completed the online form. The percentage of completed forms was calculated to determine fidelity of implementation to the ECO intervention.

Teacher On-Task Rating Similarity

During the first meeting with each teacher, the researcher asked the teacher to rate the on-task behaviors of students in the video utilized for the inter-rater reliability checks. Both teachers achieved agreement of on-task rates and ratings in no less than 2 out of 3 opportunities. A rating is counted as an agreement if the teacher is within 1 point of the student's measured on-task rate. For example, on a scale of 0 to 10, in which 0 is 0% and 10 is 100% on-task, an agreement was achieved when the teacher rated the student with an 8, while the student was on task 70% of the time, because it was within 1 point of the actual on-task rate.

Correlation Between Teacher Ratings and Direct Observation Data

A correlation coefficient was calculated for each participant to evaluate the relationship of teacher ratings on the ECO form to students' actual on-task rates. These coefficients were calculated using the rates of on-task behavior for each participant on the direct observation form and the teacher ratings on the ECO note during the intervention phase.

Duration of Check-Out and Reinforcement Sessions

The duration of each check-out and reinforcement session was gathered using a timer and noted on the fidelity checklist. The stopwatch was started when the student entered the office for the check-out session and was stopped when the student left the office/obtained a prize. The time noted for each participant was converted to seconds and recorded in an Excel spreadsheet. At the end of the study, each participant's average duration for the check-out session and the reinforcement session was calculated. In

addition, an overall duration average, in minutes, for the check-out session and the reinforcement session was calculated.

Standardized Behavior Ratings

Teachers completed the Behavior Assessment Scale for Children, 3rd edition, Teacher Rating Scale (BASC-3 TRS) to assess the students' behaviors in the areas of attention problems, hyperactivity, and learning problems pre- and postintervention. The BASC-3 TRS is a four-point Likert scale that measures frequency of behavior ranging from *Never* to *Almost Always*, intended for teachers of students 6 to 11 years of age, which can be completed in 10 to 20 minutes (Reynolds & Kamphaus, 2015). Behavioral difficulties may fall within the *At-Risk* range, between 60 and 69, or the *Clinically Significant* range, which is 70 or above.

Consumer Satisfaction and Social Validity

Teacher Questionnaire

Social validity data were collected for the acceptability of treatment effects using an adapted version of the BIRS, developed by Elliot and Von Brock Treuting (1991; see Appendix C). The BIRS has been validated as a measure of treatment evaluation in previous studies (Elliot & Von Brock Treuting, 1991). This measure uses a six-point Likert scale (range: *Strongly Disagree* to *Strongly Agree*) for 24 questions that address treatment acceptability and effectiveness. The questionnaire also contains five open-ended questions created by the researcher, addressing aspects of the intervention that the teachers liked or disliked, and one final question about what, if anything, could be done to improve the intervention.

Student Questionnaire

The students completed an adapted version of the Children's Intervention Rating Profile (Elliot, 1986) immediately after the end of the intervention phase (see Appendix C). The questionnaire consists of seven questions on a six-point Likert scale ranging from *Strongly Agree* to *Strongly Disagree*. The questions addressed the participants' thoughts about their involvement in the intervention. The student questionnaire, like the teacher questionnaire, also included five open-ended questions to address the participant's thoughts about the ECO intervention.

Fun 'O' Meter Ratings

In order to evaluate each office reinforcement session, the student completed the Fun 'O' Meter form (Jenson & Sprick, 2014). This form was used to evaluate the intervention for helpfulness and the reinforcement sessions for fun for each participant (see Appendix D). Each participant marked the Fun 'O' Meter at specified ratings and these were used to determine how each participant was feeling about participation in the intervention after each reinforcement session.

Research Design

A multiple-baseline probe design with yoked participants (Cuvo, 1979; Horner & Baer, 1978) was used to evaluate the effectiveness of the ECO Program for the participants at the school research site. Specifically, Participant 2 was yoked to Participant 1, and Participant 5 was yoked to Participant 4. A multiple-probe design allows a researcher to use random probes to evaluate the effectiveness of an intervention when continuous data examinations are not possible (Horner & Baer, 1978). There was

the possibility of participants reacting to the observer; thus, having multiple observations increases the exposure to the observer and in turn reduces participant reaction effects (Horner & Baer, 1978). Additionally, the use of a multiple-baseline design alternates the initiation of intervention phases, thus reducing threats to internal validity that are present when all participants initiate interventions at the same time (Kazdin & Kopel, 1975).

Before the start of the study, students met the following three criteria before the start of baseline:

1. Students were referred by their teacher as being significantly off task during math and independent work time.
2. The students had lower levels of both problem completion and response accuracy on math assignments, as compared to classroom peers.
3. The students obtained an on-task rate of 60% or below on their first baseline 15-minute momentary time sampling systematic observation during the independent math time within their classroom.

The baseline phase was 5 to 11 days in duration. Four participants were observed on 5 staggered days, while Participant 4 was observed on eight occasions. The intervention phase was between 18 to 19 days in duration, and either seven or eight structured direct observations were conducted for each participant. Observations of on-task behavior occurred immediately before and after each phase change for four of the participants. Participant 3 was absent for the last day of intervention, and her observation was conducted as soon as she came back to school the following week. All remaining observations were conducted at random using a predetermined observation schedule. Of the total number of observations completed across the study, 43% were assessed for interobserver reliability.

Materials

ECO Form

The ECO form consisted of a Google Form designed to resemble a typical check-in/check-out form, modified to include only a check-out time. Creation of the ECO form followed guidelines by Crone et al. (2010), Crone et al. (2004), and Knorr (2015). It was designed for teachers to rate students on a qualitative rating scale of specific behaviors chosen by the researcher and teacher. The scales had 11 options (0 to 10) for teachers to choose from, ranging from 0 to 10, where 0 equals 0% of the time on task and 10 equals 100% of the time on task. The ECO form included the participant's name, an "On Task" behavior rating grid, a rating grid for one optional behavior chosen by the teacher, an operationalized description of each behavior to be rated, and a comments section for teachers (see Appendix E and Figure 1). The comments section was to allow teachers the opportunity to provide more in-depth feedback to the school psychologist; for example, if

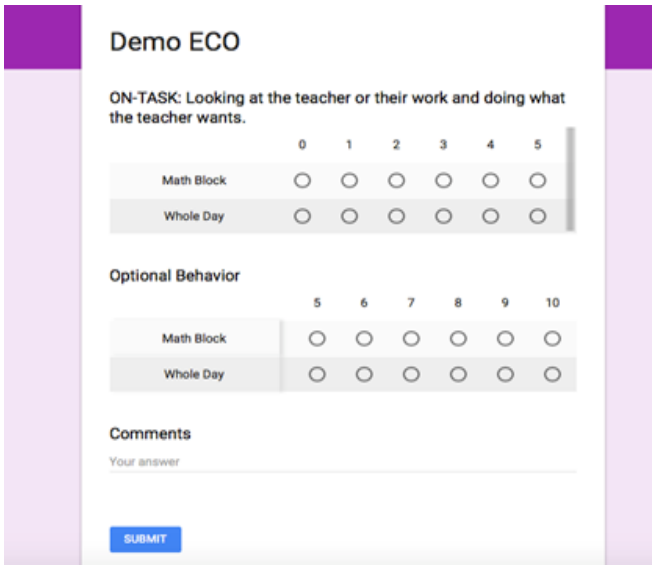
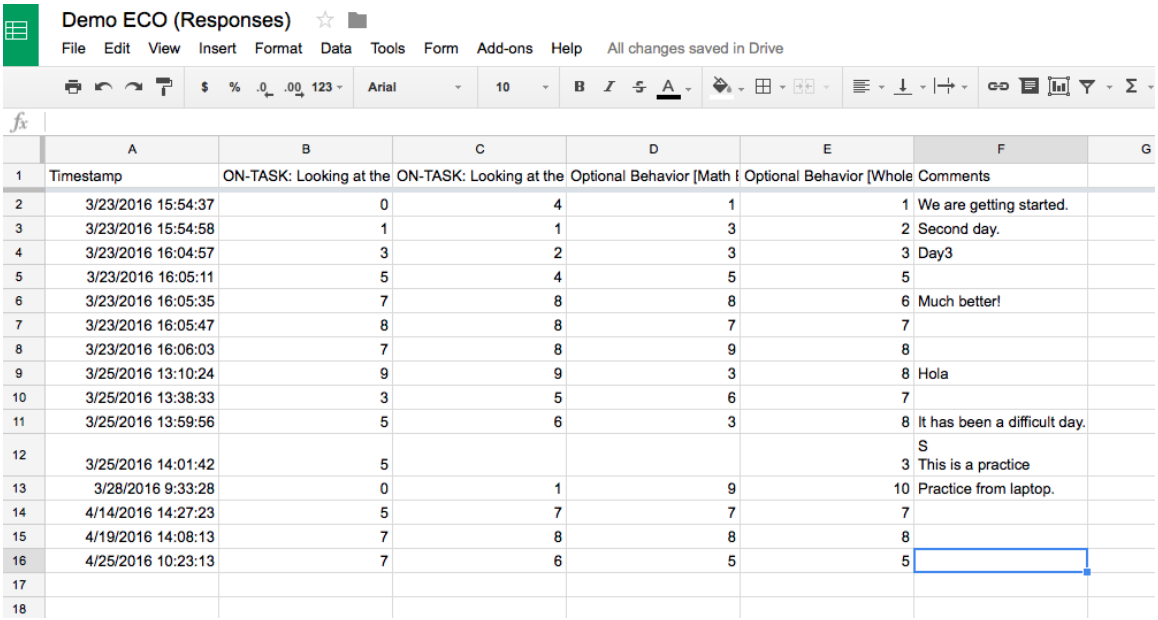


Figure 1 Electronic Check-Out (ECO) Form.

there were particular situations that might have affected the data. For guidelines on how the researcher created the ECO form from the Google Form application, refer to Appendix E. The ECO was an open form in which the user could add answers or select choices even after it was submitted. Each student had a personalized ECO form that contained his or her name, a display of their choosing, and their specific teacher-optional behavior. For this study, only the optional behavior chosen by the teacher varied by teacher.

After the ECO form was modified to the user's needs, the Google Form application automatically created a Google sheet, which is an Excel-type spreadsheet (see Figure 2) that is embedded in the Google Form application. From this spreadsheet, the Google Form application automatically graphed the data from the spreadsheet onto a line graph (see Figure 3). The spreadsheet could be viewed through the ECO form in the user's Google Drive by clicking on the "View Responses" button. The viewer could


Demo ECO (Responses)

File Edit View Insert Format Data Tools Form Add-ons Help All changes saved in Drive

	A	B	C	D	E	F	G
1	Timestamp	ON-TASK: Looking at the	ON-TASK: Looking at the	Optional Behavior [Math I	Optional Behavior [Whole	Comments	
2	3/23/2016 15:54:37	0	4	1	1	We are getting started.	
3	3/23/2016 15:54:58	1	1	3	2	Second day.	
4	3/23/2016 16:04:57	3	2	3	3	Day3	
5	3/23/2016 16:05:11	5	4	5	5		
6	3/23/2016 16:05:35	7	8	8	6	Much better!	
7	3/23/2016 16:05:47	8	8	7	7		
8	3/23/2016 16:06:03	7	8	9	8		
9	3/25/2016 13:10:24	9	9	3	8	Hola	
10	3/25/2016 13:38:33	3	5	6	7		
11	3/25/2016 13:59:56	5	6	3	8	It has been a difficult day.	
12	3/25/2016 14:01:42	5			3	S This is a practice	
13	3/28/2016 9:33:28	0	1	9	10	Practice from laptop.	
14	4/14/2016 14:27:23	5	7	7	7		
15	4/19/2016 14:08:13	7	8	8	8		
16	4/25/2016 10:23:13	7	6	5	5		
17							
18							

Figure 2 Excel-Type Embedded Spreadsheet Example.

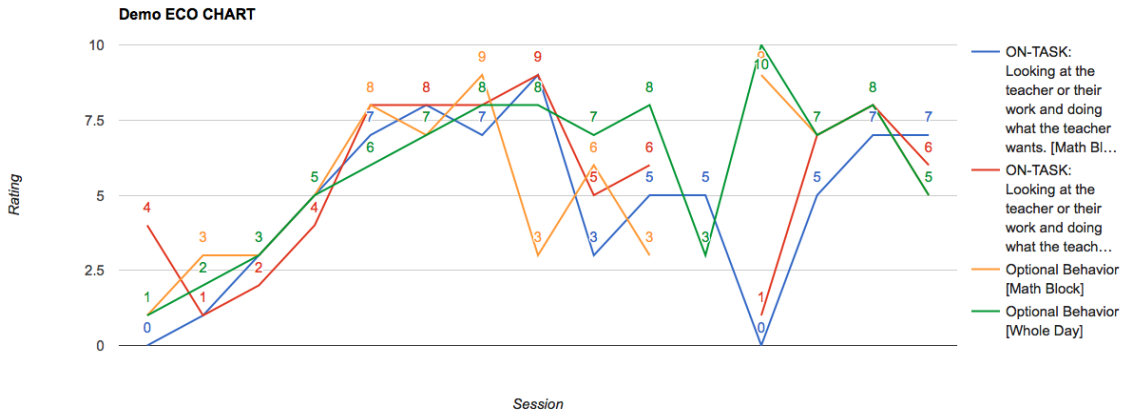


Figure 3 Response Chart Example.

access the line graph by clicking on the "Chart" tab at the bottom of the spreadsheet. When a teacher submitted an ECO, the information and data automatically updated online, and the researcher received a confirmation email.

Once the ECO for a participant was created, the teacher submitted ratings of a participant by accessing the Web page the participant's personalized ECO occupied. For the purpose of this study, the researcher had each teacher save their participants' ECO Web pages on the desktop of their school laptop computer, and as an icon on their iPad, Chrome Book, and/or cell phone's home screen. An example of the spreadsheet and the corresponding graph are represented in Figures 2 and 3. The information obtained from the ECO form that was automatically embedded into the spreadsheet included the date of the ECO ratings, each behavior's rating, and all comments made by the teacher.

Interrater and Teacher Reliability Training Videos

The researcher created four 5-minute on-task training videos to use for teacher and graduate assistant training. The videos included four 5th-grade students performing different tasks within the researcher's office. There were two female and two male

students. Student 1 was a female student who was wearing a black blouse and had her hair in a bun. Student 2 was a female student who was wearing a light gray T-shirt and a hair bandage. It is important to note that it was "Fake Injury Day" at the school, so the students wore head and arm bandages but were not actually hurt. Student 3 was a male student that wears a light gray t-shirt and hand bandage. Student 4 is a student wearing a black coat and head and arm bandages.

The videos were created utilizing a timer and a random-number generator to determine the intervals at which on-task and off-task behaviors should be performed (see Appendix F for detailed steps to creating the videos). The timer was set up to emit a sound indicating that the students should act off task for Videos 1, 2, and 4, and on task for Video 3. Each video targeted a specific student; however, all students' on-task behavior was coded. For example, in Video 1, Student 1 acted off task when the timer went off to obtain an on-task rate of 80%. In addition, the behavior of all other students in Video 1 was coded. For Video 1, Student 2 obtained an on-task rating of 100%, Student 3 obtained a rating of 93%, and Student 4 a rating of 100%.

Basic steps for creating the on-task training videos were as follows (refer to Appendix F for details):

1. Calculate how many off-task intervals would be needed to obtain 80%, 60%, 30%, and 70% on-task rates.
2. Using a random integer set generator found at www.random.org, make a set for each percentage.
3. Using the numbers obtained, mark the interval corresponding to that number as off task on the training observation form.
4. Using the time timer application (or any other that allows one to set up several timers), create timers corresponding to each off-task interval.
5. Record the video at least 10 seconds before and after the 5-minute mark, for

editing purposes.

6. Edit the videos using the iMovie application, where the sound is taken out.
7. After the videos are created, code each video utilizing the same training behavior observation form.

Prize Day Email

During the intervention phase, teachers received an email confirmation that the ECO form had been received. Utilizing a randomly generated schedule, on reward days the teachers also received an email "out of office notification," stating that the student had won a surprise reinforcement session. On these days the teacher informed the student that it was a prize day. On reward days, the students who came to the office at the end of the day for their check-out, and who had met their goals, received an opportunity to color (add) their chart moves and spin for a prize. An out-of-office email notification can be set on an email account when the user will not be able to answer emails for a determined period of time; the user can add a personalized message that is sent automatically as a reply to all emails received during the specified time. In this case, the researcher set up the out-of-office notifications only during prize days when the student had the opportunity to receive a reward.

Of every ECO form available each week (a total of five), three were randomly reinforced using a variable ratio schedule of reinforcement with three reward sessions (VR-3). The student was informed that if he or she received a score at or above his or her personal goal for on-task behavior, there was the possibility that they would get a "surprise" reward when the teacher sent the electronic form. For an example of how the "surprise" email looked, refer to Figure 4. The email was titled "Surprise Email!" and contained the following message:

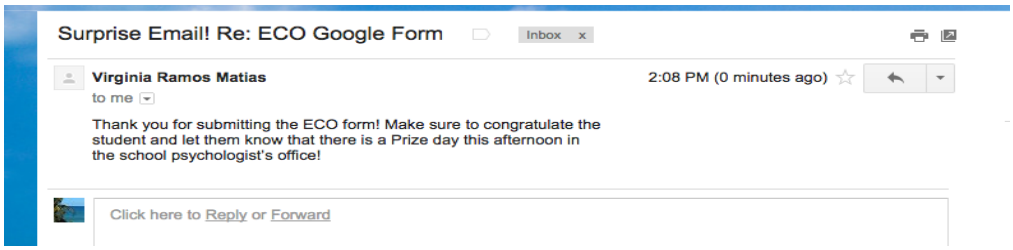


Figure 4 Surprise Email Example.

*Thank you for submitting the ECO form! Make sure to congratulate the student and let them know that there is a Prize day this afternoon in the school psychologist's office!

Spinner and Reward Menu

The Reward Spinner (modified from Jenson et al., 2009) was made up of seven different-sized wedges labeled 1 to 5. The sixth wedge was labeled "?" and corresponded to the "Mystery Motivator." The Reward Menu accompanied the Rewards Spinner, and contained a list of five items numbered 1 to 5 (see Appendix G) and an additional item labeled "Mystery Motivator." The reward associated with each number was written next to it with a pencil. The principal investigator asked each participant for items that they were interested in—special cartoons, games, sports or other interests or items the participant chose from the rewards available in the researcher's office during their orientation. During each Prize Day office reinforcement session with the researcher, the participant earned the opportunity to spin the Reward Spinner. The participant spun the arrow on the Reward Spinner and was given whatever reinforcer the arrow landed on (either a numbered reinforcer or the Mystery Motivator).

Rewards on the Reward Menu were chosen from what was already available at the researcher's office. For example, the researcher used a four-option/drawer system for

her reward contract with other students at the school. Some students chose the "Treasure Box" as an option. This box contained the "biggest" prizes. The Treasure Box was medium-sized box that had a lock on the front. The box was decorated to look like a pirate treasure chest and students earned the key to the prizes inside. Some examples of prizes include slime/silly putty, gum, yo-yos, and so forth. The researcher also had a plastic, three-drawer cabinet with each drawer marked with 1, 2, or 3, in order of prize size and value. For example, Drawer 1 had little erasers or pencils, Drawer 2 had bouncy balls, while Drawer 3 had small Nerf balls or small coloring books. When necessary, students were asked for other things they liked to earn and wanted put on their Reward Menu.

Mystery Motivator

The Mystery Motivator (Jenson et al., 2009) was a valued reinforcer that was written on a slip of paper and placed in a sealed envelope labeled with a question mark. The written reward was unknown to the participant. The researcher enthusiastically told the participants that the Mystery Motivator envelope contained a "special" reward to increase anticipation and motivation to earn a spin. Each time a Mystery Motivator reward was earned, a new reward was placed in the envelope. Mystery Rewards included but were not limited to the opportunity to spin twice for rewards, the option to choose any item on the Reward Menu, and specific other toys available in the office but not on their Reward Menu.

Chart Moves Board

Chart Moves involved the use of a blank chart that determined the occurrence of reinforcement and allowed students to monitor their own progress (Jenson et al., 2009; Lopach, 2016). The student completed a portion of the chart when certain criteria were met. When the student revealed a reward dot, the he or she earned a predetermined reward, depending on the number obtained from the Reward Spinner. The dots were randomly marked with the invisible-ink side of a Crayola Color Switchers marker. When colored with the developer side of a Crayola Color Switchers marker, the invisible ink was revealed to indicate a reward dot. A larger reward was earned when the picture or chart was fully completed.

The Chart Moves Board was used in conjunction with the Reward Spinner and Reward Menu only during reinforcement/Prize Day check-out sessions when the teacher received the Prize Day email. For example, if there were five complete weeks, for a total of 25 days, the chart moves board was utilized 15 times using the random schedule. The Chart Moves Board (see Appendix G) was comprised of diagonally bisected squares on a single page. The squares were arranged to look like a game board, with pictures of the student's larger reward. Start and end points were prominently displayed. The board contained no more than 15 divided squares, which totaled the 5 weeks of intervention.

During the student orientation session, each participant selected a large reward to be earned when the chart was completed. Each participant selected one item from a list of three possible highly valued reinforcers. A picture of the reward was printed on each participant's board next to the end point, and throughout the blank spaces on the board.

Reward procedures followed the ones presented in Lopach (2016), wherein square

halves were randomly marked with reward dots. Each reward dot signified one available spin on the Reward Spinner. The occurrence of reward dots followed a VR-3 schedule, which means that of every six half squares (comprising three total squares) available each week, an average of three halves were marked with reward dots. There were instances in which two reward dots appeared within the same square. In these cases, the student was given the chance to spin twice and chose his or her more preferred reinforcer. There also were instances in which there were no dots within a square, in which case the student did not get to spin (see Figure 5).

The participant earned a chance to color a complete square when he or she came to the office reinforcement/Prize Day session after the Prize Day email was received. The participant colored in the right side of the square half for coming to the check-out session with the researcher. The participant also colored in the left side of the square half when at check-out they met or surpassed their daily goal of being 70% on task for the math time and the whole day. Participants were required to have at least one square half colored-in

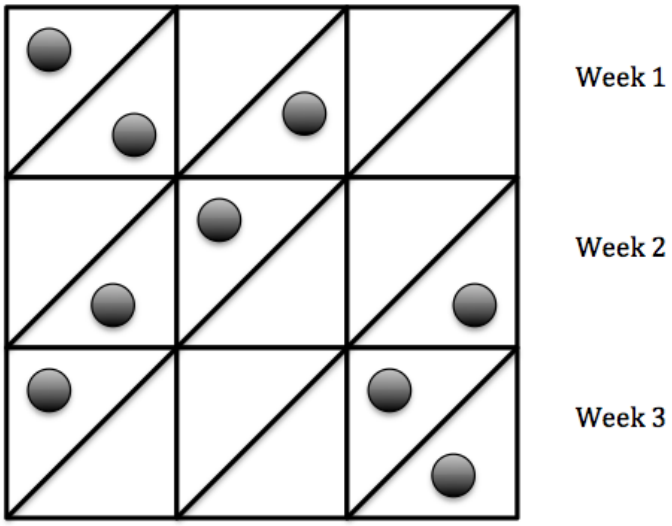


Figure 5 Example of Randomly Placed Dots.

before moving on to the next square. A Chart Moves Board is considered to be complete, and therefore the student receives the big reward, if at least 80% of the total available square halves are colored.

Treatment Fidelity Checklists

The researcher used fidelity checklists adapted from Knorr (2015) and Lopach (2016) to maintain treatment integrity during all orientation, check-out, and reinforcement day sessions throughout the study. These checklists listed each step to be taken by the researcher during each session; the researcher checked-off each step as it was completed. A sample of each fidelity checklist is located in Appendix H.

Procedures

Consent and Referral Procedures

The researcher accessed student math computational data by accessing 3rd- to 5th-grade Curriculum Based Measurement (CBM) data from AIMSweb for the winter of 2015. Most of the 5th- and 4th-grade students who fell below average or well below average were already receiving special education services. Thus, the principal investigator approached the 3rd=grade teachers of the English-only classrooms with a list of students who fell below average on the Mathematical Computation Curriculum Board Measurement (MCOMP) or had the lowest scores on the average list of the MCOMP (see Figures 6 and 7). The primary investigator briefly explained the purpose of the study, and the inclusion criteria for participants and the intervention.

After teachers agreed to participate in the study, a meeting was scheduled for the first orientation and selection of participants. Each teacher nominated at least three

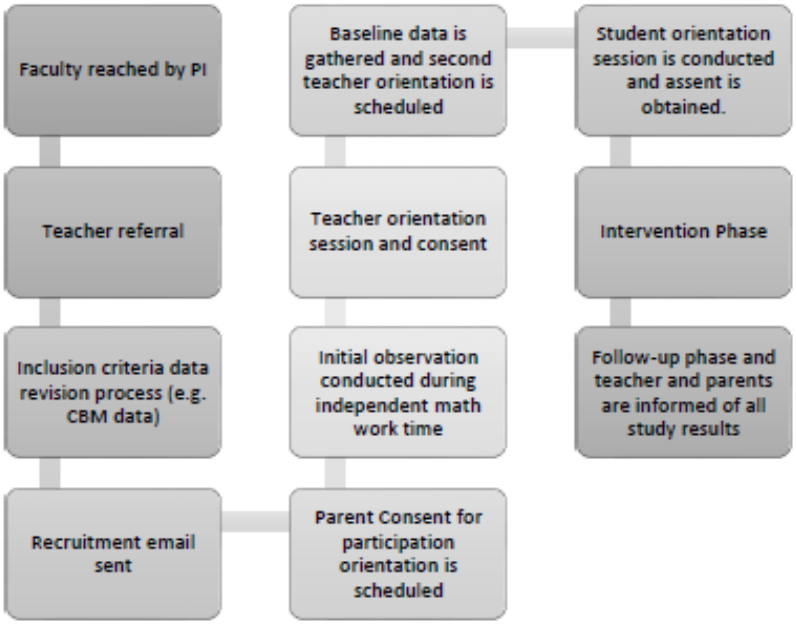


Figure 6 Timeline of Referral and Consent Procedures.

students, since the goal was to have two teachers with two students each on the ECO Program. The PI sent an email to the parents of the first six nominated students, who presented with lower levels of problem completion and response accuracy on math assignments as compared to classroom peers, along with a recruitment letter, and provided 4 days to contact the researcher. One parent immediately answered that she did not wish to participate; the other five parents either contacted the researcher or answered the call given by the researcher 4 days after the first email contact. An in-person meeting was scheduled with all five parents for orientation and consent purposes. During the meeting, the researcher described the proposed study and obtained parental permission to observe and consent for study participation if found eligible.

Parents' contact information was obtained from teachers or through the school's contact information program (Skyward). During this orientation meeting, the researcher

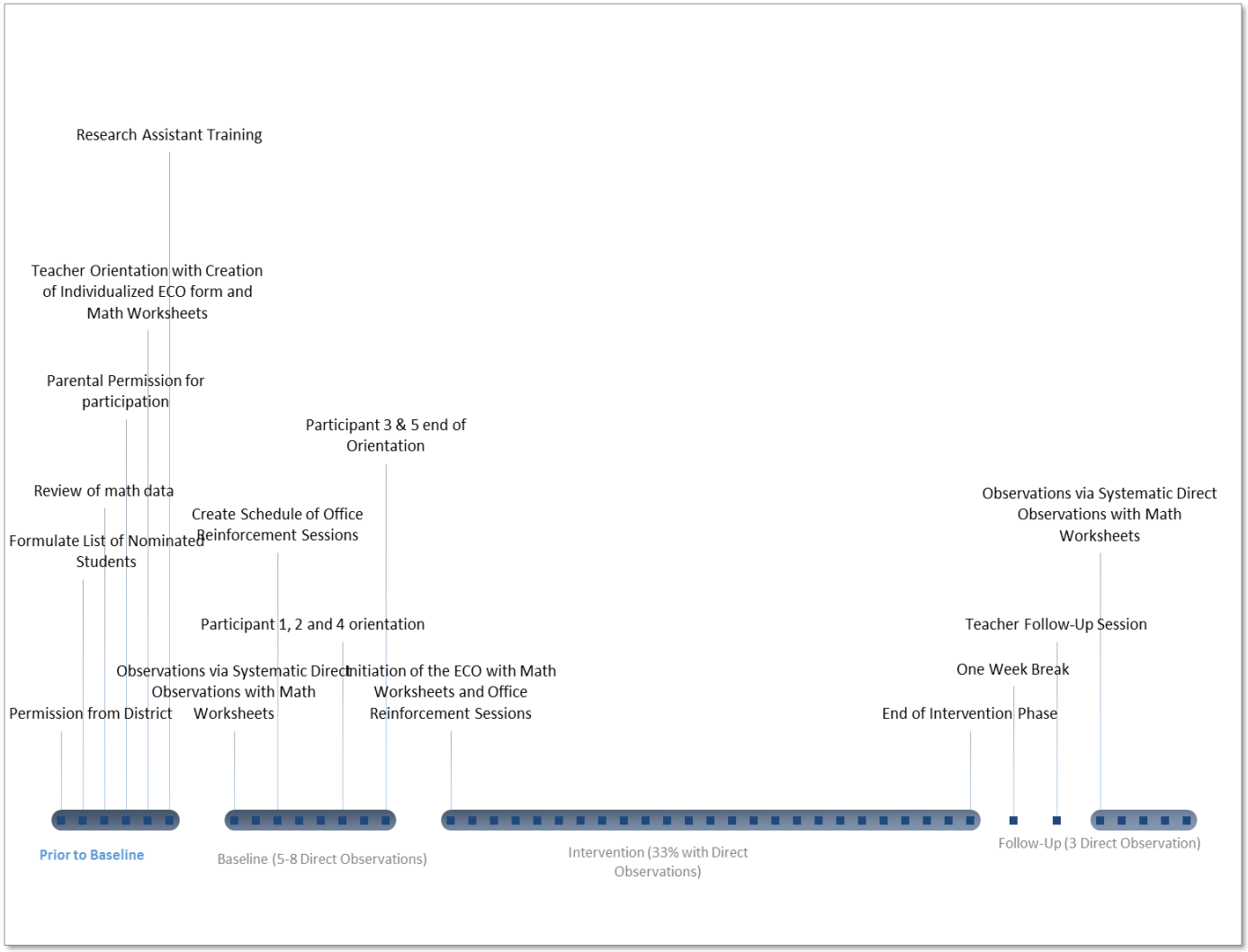


Figure 7 Timeline of the Study.

let the parents know about the teachers' concerns, the referral, and the option for study participation. A brief overview of the purpose of the study, the intervention and its components, and the procedures of the study were provided (see Appendix H). If the parent agreed to study participation, the first systematic baseline on-task observation was conducted to determine if rates of being on task were at or below 60%, and the Parental Permission for Study Participation and Qualifying Observation form was given to the parent to sign.

After the parent consented to observation and participation, an initial observation was conducted during the student's independent math work time. If the student met all criteria for inclusion (i.e., was referred by the teacher, had lower rates of problems completed, 60% or less on-task rate, and so forth), the parent was notified via phone, the teacher was notified, and meetings to discuss the study and its goals were arranged. During these prebaseline meetings, teacher consent for study participation was obtained (see Appendix H).

Four to eight systematic direct observations were conducted for baseline purposes, after parents and teachers consented to participate in the study. The researcher scheduled orientation sessions with each student immediately following the last baseline observation, informed him or her about study participation, and obtained assent (see Appendix H). The baseline observations were conducted before student assent was obtained, to decrease the probability of observer effects during observational periods; students tend to behave better when unknown or new people are in their classroom.

Observer Training and Interobserver Reliability

The researcher enlisted the help of graduate students training in a school psychology program, and the school's achievement coach, to conduct observations and probes throughout the study. The researcher and assistants met for an observation training session in order to ensure inter-rater agreement. The researcher reviewed the definitions of on-task and off-task behavior and coding instructions for the observation form in the *Tough Kid Tool Box* (Jenson et al., 2009) with the research assistants. The definition of on-task behavior that was utilized was: "Eye contact with the teacher or task and performing the requested task." Three, 5-minute observation training videos (see Appendix F) created by the researcher were used to practice conducting the observations. Practice observations were repeated until a minimum of .60 interrater reliability using Cohen's Kappa, and 80% reliability utilizing Total Percentage of Agreement, was achieved. The formulas for calculating each reliability score are presented below.

Cohen's Kappa corrects for chance agreement and was used to calculate interrater reliability. Generally, a .60 score is the accepted value for adequate reliability (Altman, 1991). The formula for Cohen's Kappa is:

$$k = (Po - Pc) / (1 - Pc)$$

where

Po = the proportion of agreement between observers of occurrence and nonoccurrence of behavior,

and

Pc = the proportion of expected agreement based on chance.

In addition, to estimate the accuracy of coding of the researcher and graduate assistants, point-by-point agreement was calculated to account for disagreements (Yoder

& Symons, 2010). According to Yoder and Symons (2010), the formula for Total Percentage Agreement considers observers' agreements on occurrence and nonoccurrence of behaviors, as well as disagreements. The formula is

$$[(A + B)/N] \times 100$$

where

A = the instances of agreement between observers of occurrence,

B = the instances of agreement of nonoccurrence of behavior,

and,

N = the sum of A + B, plus the instances in which one observer coded a behavior while the other did not (disagreements).

In other words, the point-by-point formula to calculate the total percentage of agreements is the sum of coders' agreements of occurrence and nonoccurrence of behaviors, divided by the total number of agreements and disagreements, multiplied by 100.

To maintain interobserver reliability throughout the study, the graduate assistants collected observation data for each participant for at least 33% of the observations conducted for baseline and follow up, and at least 33% of the observations conducted during the interventions phase. Thus, the graduate assistants conducted no less than six observations: two to four during the baseline phase, three to four during the intervention phase, and one during the follow-up phase, per student.

Orientation Sessions

Teacher Orientations and Calibration Training

Before participants entered the baseline phase of the study, their teacher took part in an initial orientation meeting (see Appendix H and Figure 8 for orientation steps). The

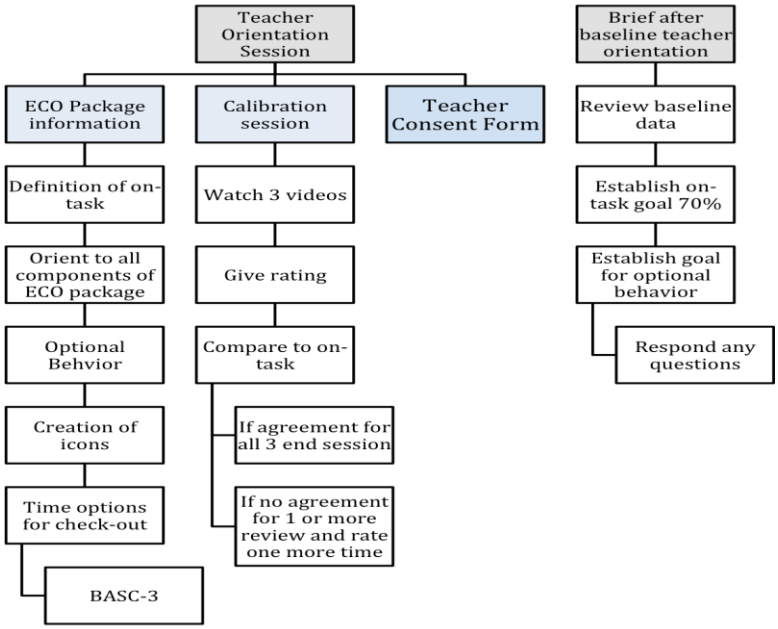


Figure 8 Teacher Orientation Steps.

researcher conducted these individual orientations in the office setting described previously. Teachers learned the program goal, which was to improve on-task behavior, and reviewed the Teacher Consent Form (see Appendix I). Teachers learned the definition of on-task behavior as presented on the systematic observation form. The teacher repeated the definition back to the researcher, and wrote it down. The researcher trained each teacher on the components of the ECO Program, including the procedures for the office reinforcement sessions, the Prize Day reinforcement email, and the Chart Moves Board. In this orientation session, each teacher chose one optional behavior that was monitored through the intervention.

During the orientation session, the researcher showed the teacher how to use the ECO form. The researcher had the teacher

- Access the Web page of their student's ECO form;

- Click on the button of the researcher's email;
- Click on a rating for each behavior to be rated;
- Write an optional comment in the Comment box; and
- Click on the Submit button at the bottom of the form.

After submitting the ratings on the ECO, the researcher showed an example of the data gathered from the ECO by accessing the spreadsheet associated with each student's ECO. The researcher then had the teacher save the Web page associated with each student's ECO on the desktop of their school laptop computer and their iPad's home screen for easy access.

Following the training, the researcher and each teacher reviewed each participant's benchmark assessment data and used the teacher's knowledge of each participant's math abilities to construct the participant's curriculum-based math worksheet. Because the curriculum was the same for all 3rd graders and teachers follow the same pace, all participants received a math worksheet with the same skills. The researcher asked the teacher which time options for check-out sessions she would prefer. Teachers decided to send students starting 20 minutes before the end of the school day. Teacher 1 sent the first student 25 minutes prior of end of school, the next student was sent after the first came in the classroom, and so forth. Teacher 2 sent her first student 10 minutes before end of school day and her second student as soon as the first came back to class. To conclude this orientation session, the researcher sent the link to the BASC-3-TRS to the teacher via email.

Following each teacher orientation, the researcher created the ECO forms and the curriculum-based math worksheets for each participant and gave the CBM forms to the

teacher. The CBM worksheets were generated from the Math Worksheet Generator located at www.interventioncentral.com, using the teacher's input of each student's current skills in math computation. During this session, the teacher and the researcher also completed the on-task rate calibration (see below).

Following the baseline phase of the study, the researcher met with each teacher again to review the baseline on-task rates for their participants. After reviewing these data, the teacher was informed that the goal for each participant was to be at least 70% on task, and each teacher decided that 70% was also an appropriate goal for the second optional behavior.

On-Task Rating Calibration Session

During this part of the teacher orientation, the researcher and the teacher viewed at least three, 5-minute on-task videos that were also utilized for the inter-rater reliability sessions. First, the definition of on-task behavior as presented in the systematic observation form was reviewed. Second, the teacher gave a rating for one of the student's on-task behaviors and recorded it on the orientation session form (see Appendix H). Each on-task percentage equated to an ECO rating; for example, an on-task rate of 80% on the systematic observation form equaled a rating of 8 on the ECO form. When necessary, rates were rounded up when comparing them to the ECO rating.

Agreement was obtained for all ratings for each teacher. Agreement was defined as the teacher rating being 1 point above or below the actual on-task percentage for the specific student. For example, if the student was on task 80% of the time and the teacher rated him with a "7" or a "9," that was considered an agreement. During the baseline, intervention, and follow-up phases, teacher ratings were compared to the momentary time

sampling results for each student. If the teacher's ratings deviated more than 2 points from the student's current on-task rate, the researcher notified the teacher of the deviation and showed the on-task rate, but no further training was provided.

Parent Orientation

Before participants entered the baseline phase of the study, their parents took part in an in-person meeting (see Figure 9). The researcher notified the parents about the teacher's referral and concern about their child's on-task rates, and obtained consent for the qualifying observation and study participation (see Appendix H). During this meeting, parents were notified of

- The purpose and procedures of the systematic observations;
- The definition of on-task behavior;
- The major points on the consent form; and
- The fact that their consent entailed enrollment in the study if their child's average on-task rates were at or below 60% for the baseline phase.

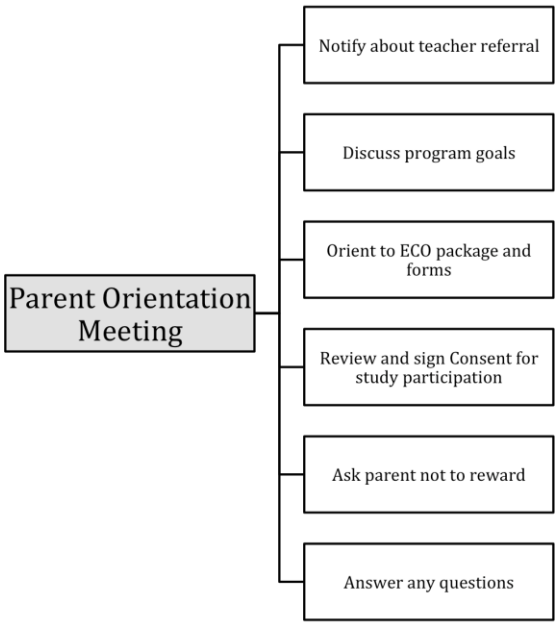


Figure 9 Parent Orientation Session Steps.

The researcher conducted these parent orientations individually with each parent. Each parent learned the program goal, which was to improve on-task behavior (see Appendix H), and was acquainted with each component of the ECO Program. The researcher showed them an example of the ECO form and an example of the data gathered from the ECO form

The researcher showed the parent an example of the surprise email, which was automatically generated and sent to the teacher on the days the researcher set an "out-of-office" responder for all response emails from the teacher. How the researcher created the Prize Day email is described in greater detail in Appendix E. The researcher asked each parent to not provide any tangible reinforcers to their child at home, as these would be given during office reinforcement sessions. Following the parent orientation, the researcher reviewed the Parent Consent Form (see Appendix I), which allowed each student to participate in the study, while clarifying any unclear information for the parent.

Participant Orientation

After baseline, but before participants entered the intervention phase of the study, they participated in an initial orientation (see Appendix H and Figure 10). The researcher conducted the orientation individually with each participant in a setting as described above. First, the participant learned the program's goal, which was to improve on-task behavior. Second, the participant learned the definition of on-task behavior and practiced the behavior. Third, the participant became familiar with each component of the ECO Program. The researcher showed an example of the ECO form and an example of the data gathered. The researcher and each participant viewed the chart created on the spreadsheet and reviewed his or her goals.

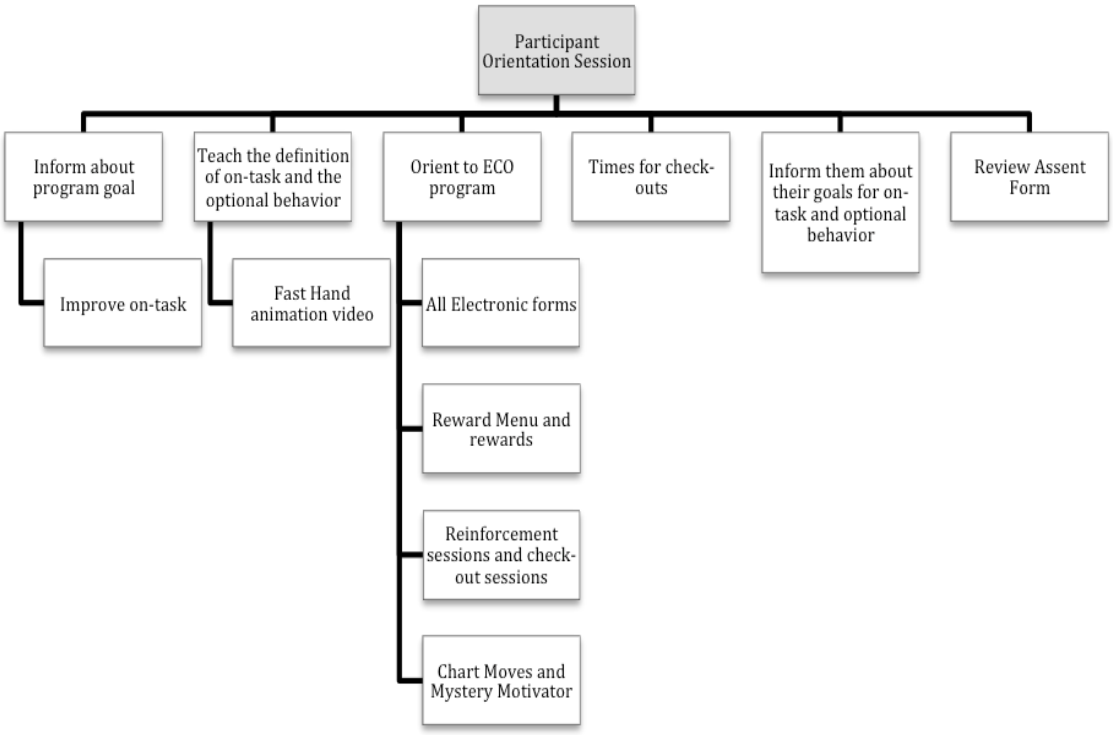


Figure 10 Participant Orientation Session Steps.

To learn the definition of on-task behavior, the students watched the "Fast-Hands Animation" video from *The Tough Kid: On-Task in a Box* (Jenson & Sprick, 2014), that described on-task behaviors. After the video, the researcher asked the participant to give the definition of on-task behaviors (i.e., to have eye contact with the teacher and perform the task). If the participant did not accurately define on-task behaviors, the researcher reviewed the definition with the student and coached the appropriate behaviors. The researcher also explained and defined the teacher's optional behavior. The researcher asked the participant to repeat the definition of the optional behavior. Afterward, the researcher asked the participant to model the behaviors that were previously taught.

To conclude the participant orientation, the researcher explained to the participant the Reward Spinner, the Reward Menu and the available rewards, the Mystery Motivator,

the Chart Moves Board, and the appropriate times to come to the office in the afternoon. The participants were able to choose five or more items they wanted to include on their personalized Rewards Menu from a list of the possible rewards available in the school psychologist's office. In addition, "big" rewards were discussed and narrowed to three, from which the participant chose one to be earned from their Chart Moves Board. The participants were allowed one spin on the Reward Spinner to obtain a prize at this time. Following the participant orientation, the researcher reviewed the Participant Assent Form (see Appendix I) and asked each participant to be part of the study, while answering any questions and clarifying as needed.

Study Phases

Baseline Phase

The researcher obtained the latest MCOMP scores for the winter benchmark for 3rd- through 5th-grade students. Most, if not all, 4th- and 5th-grade students fell within the average range in these measures, and those who did not were receiving some Tier 2 or special education service. Thus, the researcher approached the 3rd-grade English-only teachers for study participation. Each teacher was asked to nominate at least three students whom they understood were on task 60% or less of the time during math instruction and independent math work time, and had lower levels of problem completion and response accuracy on math assignments as compared to classroom peers. The benchmark data in mathematics obtained from the Math Computation (MCOMP) AimsWeb District page was reviewed for each nominated participant to determine if they had lower scores compared to same-grade peers at the elementary school and/or district level. All students fell within the below-average range compared to other same-grade

students within the district for the winter benchmark. MCOMP from AimsWeb is a brief, standardized form of curriculum-based assessment designed to analyze students' skills of math operations, with national and district level norms from 1st to 12th grade (Pearson, 2012).

Parents of the students who met the above criteria, referral by the teacher and lower scores on the MCOMP, were contacted, and consent for a qualifying observation and study participation was obtained. The researcher conducted the first qualifying on-task, 15-minute momentary time sampling observation during the student's regular independent math work time, the time in which the student would complete the math probes for the study. All participants obtained scores that fell below the cutoff 60% on-task rate, and this observation was used as the first baseline data point. All but Participant 1 obtained an average of 60% or below for the baseline phase. Participant 1 obtained an average baseline on-task rate of 64.8%; however, she continued into study participation.

Five to eight initial systematic baseline direct-observation probes were completed for each participant using a momentary time sampling observation format. The researcher or graduate assistant completed these probes during independent math seatwork time. Each participant completed individualized curriculum-based math worksheets. The teacher provided the worksheets as the researcher or graduate assistant entered the room and signaled the teacher. No coaching or encouragement was given to the student to complete the assignment; the teacher simply told the student to complete the worksheets.

The baseline data gathered were not shared with the parents or participants prior to the conclusion of the study. The researcher or researcher assistants collected baseline data points across 5 to 11 days. For Participants 1 and 2, baseline data were collected

across 5 days, for Participant 3 across 8 days, and for Participants 4 and 5, baseline data were collected across 11 days. An observation was conducted right before and immediately after the intervention phase was started for each participant. After collecting the fifth probe, each participant entered the intervention phase, with the exception of Participant 4. Participant 4 entered the study following observations, after a more consistent, flatter trend was obtained. Participants 1 and 2 entered the study on Day 6, Participant 3 on Day 10, and Participants 4 and 5 on Day 12.

Following the baseline phase, the researcher met with each participating teacher to review each participant's on-task data. The researcher asked each teacher to recommend a percentage goal for the optional behavior for each participant, but indicated that 70% was the goal for the on-task behavior. During each participant's orientation session, he or she learned of his or her goals. Teachers chose the 70% goal for the optional behaviors so as to maintain consistency for participants.

Intervention Phase

During the intervention phase, teachers rated their participants using the ECO form immediately after the end of the math period in which the students completed the worksheets and at the end of the day for both of the behaviors (being on task and the optional behavior). As in the baseline phase, participants had 15 minutes to complete as much of the worksheet as they could. Each day of the intervention phase, teachers collected the curriculum-based math worksheets and gave them to the researcher. The researcher asked teachers to complete their ratings on the ECO form of the participant's behaviors immediately following the math probe time, and at the end of the day. If a teacher rating was not received immediately following the math time, the researcher

sought out the teacher and provided a reminder.

The intervention phase lasted 4 to 5 weeks. The researcher chose this minimum following the school's model of MTSS. It has been recommended that an intervention should be in place anywhere from 4 to 6 weeks before decisions could be made as to its effectiveness and the students' progress. The intervention lasted 5 weeks for Participants 1 and 2 and 4.5 weeks for Participants 3, 4, and 5.

During the intervention phase, the researcher or research assistant completed independent systematic direct-observation probes while the teacher observed the participants for the purpose of the ECO rating and the teacher calibration. These occurred 37% of the time for all participants across the intervention phase (e.g., if the intervention phase lasted 25 days or 5 weeks, there were at least eight observations conducted).

The researcher created an observation schedule for each participant prior to the start of the intervention phase. Third-grade students receive math instruction and independent time at the same hour in the day. Thus, due to availability of time slots and research assistants, observations could not be made randomly; instead, the researcher had to create a schedule based on research assistants' availability during weekdays. Some observations had to be rescheduled or moved due to participant absences or changes in the school's schedule, but remained close to the original time slot.

During the intervention phase, the researcher began to set "out-of-office" responder emails. These automatically generated Prize Day emails to teachers' responses confirmed that the researcher received the ECO data. The researcher set the out-of-office emails the day before or the day of an office reinforcement session was scheduled to occur. The researcher set this by accessing the Gmail account used for the ECO form,

accessing “Settings,” and clicking the “Out of Office Responder On” button.

Office reinforcement sessions were staggered by 5 minutes at the end of the day following a schedule designed so each participant had the chance to receive an average of three office reinforcement sessions per week. To ensure that a reinforcement schedule for each participant was conducted in a randomized manner, the researcher created the schedule before the start of the intervention phase utilizing a random-number generator. The schedule consisted of three office reinforcement sessions per week across the 4 to 5 intervention weeks for each participant. On weeks that were short due to the district schedule, only two office reinforcement sessions were conducted.

Follow-Up Phase

The follow-up phase was completed during the last week of school. At the start of the 1-week follow-up phase, the researcher held a meeting with each participant’s teacher. The researcher asked each teacher to provide the definition of on-task behavior. The researcher reviewed the goals for each behavior and the steps to use the ECO program. The student did not receive any reinforcements or check-out sessions at this time. The researcher used the Teacher Follow-Up Session Checklist to ensure that meetings were conducted with fidelity (see Appendix H).

Each participant completed 1 full week of a follow-up phase; this occurred one week following the end of the intervention phase for each participant. Each participant was observed through three systematic direct-observation probes using a momentary time sampling format. As in the baseline and intervention phases, these observations lasted 15 minutes and occurred while the participants completed their curriculum-based math worksheets during independent math seatwork time. A schedule for these observation

probes was created prior to the participant entering the intervention phase. Information from these observations was not shared with the parents or participants prior to the conclusion of the study. After each session, the teacher gathered each participant's curriculum-based math worksheet and gave it to the researcher.

Office Reinforcement/Prize Day Sessions

During the intervention phase, there were at least three office reinforcement sessions in which the students also checked-out with the researcher. Each such session was conducted in a standardized format following the outline provided in Appendix H and the steps listed below. Each session lasted an average of 3 minutes, with some sessions taking up to 4 minutes. These office reinforcement/Prize Day sessions took place during the check-out session after a "Surprise Email" was sent to the teachers.

During the reinforcement sessions students reviewed their on-task rates for that day, reviewed their ratings from their teacher, and reviewed the ratings for the optional behavior chosen by their teacher (see Appendix H). Participants also practiced each behavior. Afterward, each participant used the Reward Spinner to obtain a prize on his or her individualized Rewards Menu. After participants received their prize, they marked the Fun 'O' Meter, indicating their level of enjoyment for the office reinforcement session. If the student did not come to a reinforcement session, they did not receive the opportunity for reward at another time.

Steps for the office reinforcement session included the following:

1. The researcher enthusiastically welcomed the student to the office and let him or her know that it was a Prize Day.
2. The student colored-in the right side of the Chart Move square for coming.
3. The researcher opened the embedded spreadsheet and graph.

4. The student interpreted the graph and said whether or not they met their on-task goal of 70% or more for that day. If they did not, they were thanked for coming to the session and encouraged to try their best the next day.

5. The student reviewed any comments made by their teacher.

6. If the student did meet his or her goal, the researcher had the student color-in the left side of the square for meeting the goal.

7. If dots appeared, the student used the spinner and earned a prize or Mystery Motivator.

8. The researcher asked the student to define what on-task behavior is and to model it, if necessary.

9. The researcher had the student rate his or her enjoyment of the reinforcement session using the Fun 'O' Meter.

10. Before letting him or her go, the researcher reminded the student that he or she was also working for the big prize, and encouraged them to do their best the next day.

11. The researcher let the student know that she looked forward to seeing him or her the next afternoon.

Check-Out Sessions With Positive Adult Feedback

Of the five available check-out sessions for the week, students did not receive the opportunity to earn a prize on 2 of the days. These were called the check-out sessions with positive adult feedback. The researcher conducted each office check-out session in a standardized format following the outline provided in Appendix H and the steps listed below. Each session lasted an average of 1 minute for each participant. Once the participant entered the intervention phase, the check-out sessions took place at the end of the school day following a previously created schedule that was staggered by 5 minutes based on the teacher's input.

During the check-out sessions, the researcher reviewed the teacher's ratings of on-task behavior and the ratings for the optional behavior chosen by the participant's

teachers with each participant, utilizing the ECO graphs in the spreadsheet; however, none of the reinforcement materials (i.e., Reward Spinner, Reward Menu, Chart Moves Board, and so forth) were used during a regular check-out session. It was the participant's responsibility to seek out an office check-out session. If a participant did not come to the available check-out session, the researcher conducted a similar session at their next earliest convenience. The student was coached and encouraged to be on-task during the next day and not to forget the check-out session.

The following were the steps used in the check-out sessions:

1. The researcher enthusiastically welcomed the student to the office and thanked him or her for coming.
2. The researcher opened the embedded spreadsheet and graph.
3. The student interpreted the graph and told the researcher if he or she had met their goals for that day.
4. The student reviewed any comments made by the teacher.
5. Before letting them go, the researcher encouraged the student to do their best the next day and reminded him or her that they might get a Prize Day.
6. The researcher let the student know that she looked forward to seeing them the next afternoon.

Data Analysis

On-Task Rates

On-task rates were collected via systematic direct observation with the researcher as primary data collector. The percentage of time each participant was on task was calculated by taking the number of intervals rated as being on task and dividing that by the total number of intervals observed. Data were plotted to allow visual analysis of any patterns in the difference between each participant's baseline, intervention, and follow-up

on-task rates.

Effect Sizes

Improvement Rate Difference

An effect size was calculated for each participant using Parker, Vannest, and Brown's (2009) improvement rate difference (IRD). The IRD, also referred to in the medical literature as "risk reduction" or "risk difference," is a recommended and widely used index in evidence-based medicine (Parker et al., 2009). Some advantages of using IRD include the simplicity of calculation, similarity with percentage of nonoverlapping data and visual analysis, availability of confidence intervals, and wide applicability to single-case research designs (Parker et al., 2009). A separate IRD effect size was calculated for each participant during the intervention; the formula used was as follows:

Improvement rate (IR) of treatment phase(s) – improvement rate of baseline phase(s)

where IR is defined as

$$\frac{\text{\# Improvement data points in phase}}{\text{\# Total data points in phase}}$$

and where an improved data point in the baseline is one that equals or exceeds any data point on the treatment phase, and where an improved data point in the treatment phase is one that exceeds all data points on the baseline phase.

Tau-U

Tau-U is a statistical analysis for single-case research, described by Parker, Vannest, Davis, and Sauber (2011). The authors explained that Tau-U performs "reasonably well with autocorrelated data" (p. 284). Tau-U considers trend and level, is distribution free, and is unlikely to reach the ceiling of 100% seen with other, simpler

nonoverlap techniques (Parker et al., 2011). Tau-U can be described as the amount of data that show an improvement between intervention phases, and is expressed as a percentage (Parker et al., 2011). In the case of a multiple-baseline design, a Tau-U calculation is made for each subject and then an average is calculated.

Parker, Vannest, and Davis (2011) displayed the steps and formula to calculate Tau-U for a multiple-baseline design study, as follows:

$$\left[\frac{\text{\# of positive pairs - \# of negative pairs}}{\text{Total number of pairs}}\right] \times 100$$

Math Work Problems Completed and Problems Completed Correctly

Curriculum-based math worksheets completed by participants were analyzed by the researcher to determine the average number of problems completed, the number of problems completed correctly, and the percentage of problems completed correctly during each phase of the study. For each participant, the researcher counted the total number of problems solved and the total number of problems solved correctly for each phase. The data were plotted to allow for visual analysis of any patterns in the difference between the participants' performance during all study phases.

Teacher Response Accuracy

The calculated on-task rates were compared to teacher-rated on-task rates on the ECO form. Teachers rated on-task rates on the ECO across the same days as the observation probes were conducted. A Pearson Product-Moment Correlation Coefficient (Rogers & Nicewander, 1988) between the systematic direct-observation probes and teacher-rated on-task rates was calculated to determine the degree of agreement between

these sources. One coefficient was calculated for each participant that included all comparisons across the intervention phase.

Standardized Behavior Ratings Pre- and Postchange

Teachers completed pre- and postintervention standardized ratings on the BASC-3. The *t* scores for the hyperactivity, attention problems, and learning problems scales were plotted to allow for visual analysis of any patterns in the difference between the participants' performance before and after the intervention. A *t* test between pre and post scores with a Bonferroni correction for experiment-wise error was calculated. The critical value was calculated by dividing the *p* value by the number of contrasts; in this case .05/3 = 0.0167.

Fidelity to the Use of the ECO Intervention

The number of ECO forms received before the student reached the investigator's office, throughout the study, was noted. The percentage of completed ECO forms was calculated to determine fidelity of implementation. Dividing the number of completed ECO forms by the total number of forms that could have been received and multiplying them by 100 provided the percentage of ECO forms received.

Average Duration of the Check-Out Sessions

For each check-out session with and without reinforcement, the primary investigator used a stopwatch to measure the duration of the check-out session. At the end of the study, the average number of minutes it took to conduct a regular check-out session and a reinforcement session for each participant were calculated. In addition, an overall average was calculated to compare with the recommended number of minutes

reported in the literature. It is theorized that having only a check-out session would take 50% or less of the time taken by a traditional CICO intervention.

Consumer Satisfaction/Social Validity

Ratings gathered from the consumer satisfaction questionnaire are presented in a table format. The questions are listed along with the responses that each participant gave. A mean rating for each question on the teacher and participant questionnaire is reported. Open-ended information is reported in a narrative form. After assigning a numerical value to the Fun 'O' Meter ratings from each participant's office reinforcement sessions, one average was calculated for each participant that included all Fun 'O' Meter ratings.

RESULTS

The purpose of the current study was to evaluate the effectiveness of an ECO intervention to improve on-task behavior with only a check-out session and a direct reinforcement component; typical CICO interventions have both check-in and check-out sessions. This intervention also rewarded students for their on-task behavior, while many CICOs do not provide tangible reinforcers; in addition, in most, parents do not receive student ratings. The ECO intervention was implemented with five, 3rd-grade students and their teachers in one public dual-immersion elementary school. As a result of the study, the following data were obtained for each question.

Research Questions

Question 1

> Will rates of on-task behavior for participants be higher during math time than baseline on-task rates after receiving the ECO intervention, as measured through direct observation in the classroom?

The overall average baseline rate of on-task behavior for all participants was 47% based on the systematic direct observations conducted during the participants' independent math seatwork time. During the intervention phase, the overall average rate of on-task behavior was 78%, which constitutes a 31% increase in on-task rates from baseline across all study participants. The average Tau-U from baseline to intervention for all participants was 0.96 and the average baseline to intervention IRD was 0.82. These

results indicate that overall, there was a 96% and 82% data improvement from baseline to intervention, respectively. See Tables 1 and 2 for the differential effects for each participant. Two of the 5 participants had on-task rates at or above 70% during the intervention phase, and 1 participant had all but one data point at or above 70% during the intervention phase. See Figure 11 for participants' rates of on-task behavior throughout all phases of the study.

Participant 1's rate of on-task behavior was 65% for the baseline phase. She had a slight upward trend during her baseline phase, which impacted her results, and may have made the changes equivocal. Her average on-task rate for the intervention phase was 89%, which indicates a 24% increase from baseline. For on-task rates, Participant 1's baseline to intervention Tau-U was 0.9 and her IRD from baseline to intervention was 0.69. When adjusted for baseline trend, Participant 1's Tau-U score decreased to .75.

Participant 2's rate of on-task behavior was 57% for the baseline phase. His

Table 1

On-Task Percentages for All Participants
Across Baseline and Intervention Phases

Participant	Baseline	Intervention (Change From Baseline)
1	65%	89% (+24%)
2	57%	85% (+28%)
3	25%	67% (+42%)
4	53%	79% (+26%)
5	33%	72% (+39%)
Total Average	47%	78% (+31%)

Table 2

Baseline to Intervention Effect Sizes for On-Task Percentage

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	0.9	1	1	.89	1	.96
IRD	.69	.86	.86	.77	.86	.82

Note. IRD = Improvement rate difference.

average on-task rate for the intervention phase was 85%, which indicates a 28% increase from baseline. For on-task rates, Participant 2's baseline to intervention Tau-U was 1 and his IRD from baseline to intervention was 0.86.

Participant 3's rate of on-task behavior was 25% for the baseline phase. Her average on-task rate for the intervention phase was 67%, which indicates a 42% increase from baseline. For on-task rates, Participant 3's baseline to intervention Tau-U was 1 and her IRD from baseline to intervention was 0.86.

Participant 4's rate of on-task behavior was 53% for the baseline phase. Participant 4 had a variable and slightly upward trend during his baseline phase, which made his results equivocal. His average on-task rate for the intervention phase was 79%, which indicates a 26% increase from baseline. For on-task rates, Participant 4's baseline to intervention Tau-U was 0.89 and his IRD from baseline to intervention was 0.77. When controlling for baseline trend, Participant 4's Tau-U score decreased to .57.

Participant 5's rate of on-task behavior was 33% for the baseline phase. His average on-task rate for the intervention phase was 72%, which indicates a 39% increase from baseline. For on-task rates, Participant 5's baseline to intervention Tau-U was 1 and his IRD from baseline to intervention was 0.86.

Participants' On-Task Rates Across All Study Phases

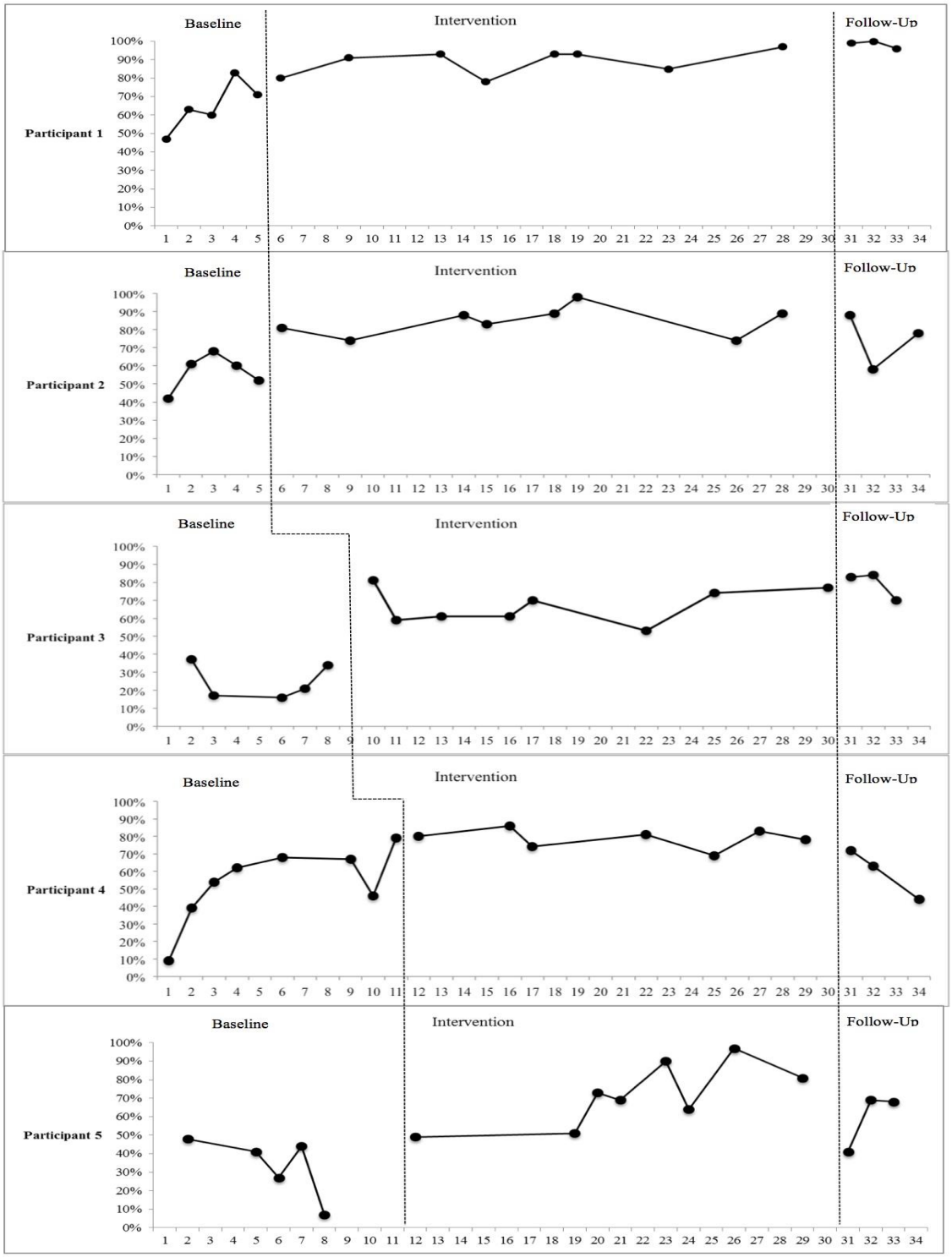


Figure 11 Participant Rates of On-Task Behavior Across Study Phases as Measured by Independent Direct-Observation Probes.

Although all participants showed a large increase in their level of on-task behavior during the intervention phase as compared to their baseline, 2 out of 5 participants showed unclear intervention effects based on visual analysis due to their upward trend on the baseline phase. When controlled for baseline levels for these 2 participants, their Tau-U scores decreased from very large to moderate-to-large, while the remaining participants obtained scores that fell within the large-to-very large range (Parker et al., 2009; Vannest & Ninci, 2015). All of the participants exceeded their goal of 70% for more than 50% of the observations, and 3 exceeded goal for more than 80% of the total observations during the intervention phase. These results satisfy and answer Research Question 1. These results indicate that the ECO intervention increased participants' rates of on-task behavior as compared to baseline.

Question 2

> Will rates of on-task behavior of participants be maintained at a 1-week follow up, as measured by direct observation after receiving the ECO intervention?

Follow-up data were collected during the last 5 days of school. The average rate of being on-task for all participants at the 1-week follow up was 74%, which represents a 25% increase from the baseline phase. The average baseline-to-follow-up Tau-U for all participants was .69 and the average baseline-to-follow-up IRD was .63. These effect sizes indicate a 69% and a 63% improvement rate, respectively, from initial rates of on-task behaviors at the 1-week follow up. The average intervention-to-follow-up Tau-U was -.04, while the average intervention-to-follow-up IRD was .11 for all participants. These effect sizes indicate a 4% decrease from intervention on-task rates and an 11% improvement rate from intervention to follow up, respectively. See Tables 3 through 5 for

Table 3

On-Task Percentages for All Participants Across Study Phases

Participant	Baseline	Intervention	Follow-Up (Change From Baseline)
1	65%	89%	98% (+33%)
2	57%	85%	75% (+18%)
3	25%	67%	79% (+54%)
4	53%	79%	60% (+7%)
5	33%	72%	59% (+26%)
Total Average	47%	78%	74% (+27%)

Table 4

Baseline to Follow-Up Effect Sizes for On-Task Percentage

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	1	.60	1	.17	.67	.69
IRD	.79	.54	.79	.18	.52	.63

Note. IRD = Improvement rate difference.

Table 5

Intervention to Follow-Up Effect Sizes for On-Task Percentage

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	0.92	-.46	0.71	-.90	-.46	-.04
IRD	.71	-.26	.57	-.43	-.13	.11

Note. IRD = Improvement rate difference.

the differential effects for each participant.

Participant 1's average on-task rate across the three observations was 98% at the 1-week follow up; it was 65% at baseline and 89% during the intervention phase. The average follow-up rate of on-task behavior was slightly higher than the baseline- and intervention-phase on-task rates. For on-task rates, Participant 1's baseline-to-follow-up Tau-U was 1.0 and her IRD was .79. Her intervention-to-follow-up Tau-U was .92 and her IRD was .71

Participant 2's average on-task rate across the three observations was 75% at the 1-week follow up; it was 57% at baseline and 85% during the intervention phase. The average follow-up rate of on-task behavior was lower than in the intervention phase but higher than the baseline rate. His baseline-to-follow-up Tau-U was .60 and his IRD was .54. For on-task rates, Participant 2's intervention-to-follow-up Tau-U was -.46 and his IRD was -.26.

Participant 3's average on-task rate across the three observations was 79% at the 1-week follow up; it was 25% at baseline and 67% during the intervention phase. The average follow-up rate of on-task behavior was higher than at baseline and during the intervention phase. Her baseline-to-follow-up Tau-U was 1.0 and her IRD was .79. For on-task rates, Participant 3's intervention-to-follow-up Tau-U was 0.71 and her IRD was .57.

Participant 4's average on-task rate across the three observations was 60% at the 1-week follow up; it was 53% at baseline and 79% during the intervention phase. The average follow-up rate of on-task behavior was slightly lower than the intervention phase rate but higher than the baseline rate. His baseline-to-follow-up Tau-U was .17 and his

IRD was .18. For on-task rates, Participant 4's intervention-to-follow-up Tau-U was -0.90 and his IRD was -.43.

Participant 5's average on-task rate across the three observations was 59% at the 1-week follow up; it was 33% at baseline and 72% during the intervention phase. The average follow-up rate of on-task behavior was lower than in the intervention phase but higher than the baseline rate. His baseline-to-follow-up Tau-U was .67 and his IRD was .52. For on-task rates, Participant 5's baseline-to-follow-up Tau-U was -.46 and his IRD was -.13.

All participants obtained on-task rates for the 1-week follow up phase that were above their baseline on-task rates. Three of the participants obtained follow-up average on-task rates that were slightly lower than their average intervention rates. Two of the participants obtained on-task behavior rates that were at or above their goal of 70% for all of their follow-up observations; Participant 2 had two that fell at or above 70% and Participants 4 had one falling at the 70% goal.

Four of the 5 participants obtained baseline-to-follow-up effect sizes that fell within the large-to-very large range (Parker et al., 2009; Vannest & Ninci, 2015). Participants 1 and 3's intervention-to-follow-up effect sizes were positive and fell within the large-to-very large range, while the remaining ones showed decreasing effect sizes from intervention to the 1-week follow up. Although the results might have been affected by the fact that it was the last week of school, these results satisfy and answer Research Question 2. On-task follow-up rates for all participants remained higher than baseline rates and were comparable to those in the intervention phase. Rates of on-task behavior at the 1-week follow up increased for 4 out of 5 participants compared to baseline rates of

on-task behavior. When compared to intervention on-task rates, 2 participants had higher follow-up on-task rates, while the remaining 3 participants had decreases after intervention.

Question 3

> Will effect sizes for the ECO Program be comparable to those of the standard CICO intervention?

The mean Tau-U for the intervention phase was .96 and for the follow-up phase was .69. The mean IRD for the intervention phase was .82 and for the follow-up phase it was .63. In one of the latest meta-analyses on the CICO intervention, Hawken et al. (2014) reported that the CICO intervention had small effect sizes when using Cohen's *d* (d = .37) but large regression, R^2 = .23 effect sizes. When using PND, the authors reported a median moderate effect size of 68%. Modified versions of the CICO intervention (i.e., specific behavioral goals that target other functions of behavior) have Tau-Us ranging from .57 to .90 (Wolfe et al., 2015). The results of this study satisfy Research Question 3 and suggest that effect sizes for the ECO intervention are comparable to those of standard CICO interventions and modified CICO interventions with fewer program components and a reinforcement system.

Question 4

> Will participants' rates of on-task behavior after receiving the ECO intervention be similar to those of their classroom peers who have not received the intervention?

Based on the systematic-observation data obtained during the baseline phase of the study, participants' on-task rates show a large discrepancy with the on-task rates of same-age and -gender peers used as comparisons. The average baseline rate of on-task

behavior for all participants was 47%, while for same-sex classroom peers was 73%. For the intervention phase, participants' average on-task rate was 78%, while their peer comparisons obtained an average on-task rate of 79%. The difference between the rates of being on-task at baseline decreased from 26% at baseline to 1% for the intervention phase. See Figure 12 for detailed percentages for each participant.

Participant 1's observational data indicate that she obtained an on-task rate of 65% for the baseline phase and her same-sex classroom peers were displaying on-task rates of 78%. During the intervention phase, Participant 1 obtained an on-task rate of 89%, while her peers obtained a rate of 68%. The difference between Participant 1's on-task rate and that of the classroom peers decreased from 13% to -21%, meaning that Participant 1's rate was higher than that of her classroom peers during the intervention phase.

Participant 2's observational data indicate that he obtained an on-task rate of 57% for the baseline phase and his same-sex classroom peers were displaying rates of 73%.

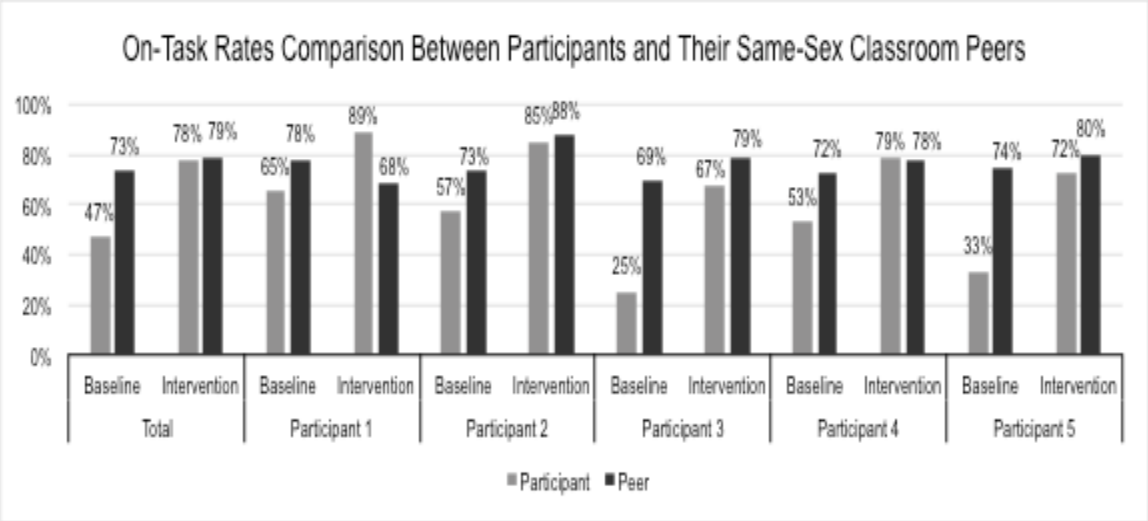


Figure 12 Comparison of On-Task Percentages Between All Participants and Same-Sex Classroom Peers Across Baseline and Intervention Phases.

During the intervention phase, Participant 2 obtained an on-task rate of 85%, while his peers obtained a rate of 88%. The difference between Participant 2's on-task rate and that of the classroom peers decreased from 20% to 3%, which approximated that of his same-sex classroom peers during the intervention phase.

Participant 3's observational data indicate that she obtained an on-task rate of 25% for the baseline phase and her same-sex classroom peers were displaying on-task rates of 69%. During the intervention phase, Participant 3 obtained an on-task rate of 67%, while her peers obtained a rate of 79%. The difference between Participant 3's on-task rate and that of her classroom peers decreased from 44% to 10%, meaning that Participant 3's rate was similar to her classroom peers during the intervention phase.

Participant 4's observational data indicate that he obtained an on-task rate of 53% for the baseline phase and his same-sex classroom peers were displaying on-task rates of 72%. During the intervention phase, Participant 4 obtained an on-task rate of 79%, while his peers obtained a rate of 78%. The difference between Participant 4's on-task rate and that of his classroom peers decreased from 19% to -1%, which approximated that of his same-sex classroom peers during the intervention phase.

Participant 5's observational data indicate that he obtained an on-task rate of 33% for the baseline phase and his same-sex classroom peers were displaying on-task rates of 74%. During the intervention phase, Participant 5 obtained an on-task rate of 72%, while his peers obtained a rate of 80%. The difference between Participant 5's on-task rate and that of his classroom peers decreased from 41% to 8%, which approximated that of his same-sex classroom peers during the intervention phase.

All participants' on-task rates increased during the intervention phase, and 4

participants showed on-task rates similar to those of same-sex classroom peers. Participant 3 was the least similar and the only participant who did not exhibit on-task behavior at a level similar to that of her peers, with a difference of 12% points. Globally, participants showed an on-task rate of 47% during baseline, which was 26% lower than peers' rates during the baseline phase. However, overall, participants' on-task rates during the intervention phase were 78%, which is only 1% lower than that of their classroom peers. These results satisfy Research Question 4 and indicate that the ECO intervention increased 4 participants' on-task rates to a level similar to that of same-sex classroom peers.

Question 5

> Will teacher ratings of participant's on-task behavior for math time on the ECO form increase over time?

For on-task behavior during the math block, teacher ratings collected for the baseline phase using the ECO form averaged 4.5 out of a possible 10 for Teacher 1 and an average of 3.9 out of 10 for Teacher 2. Teacher 1's students were Participants 1, 2, and 3, and Teacher 2's students were Participants 4 and 5. Teacher 1's average rating for the intervention phase was 8.0 and for the follow-up phase was 7.6. Teacher 2's average range for the intervention phase was 7.4 and for the follow-up phase was 6.5 (see Figure 13).

Participant 1's on-task electronic math-time teacher rating was 4.8 on average for the baseline phase, 8.5 for the intervention phase, and 8.7 for the follow-up phase. Average ratings for the balance of the participants were as follows: Participant 2—baseline 5.4, intervention 8.5, follow-up 8.0; Participant 3—baseline 3.3, intervention

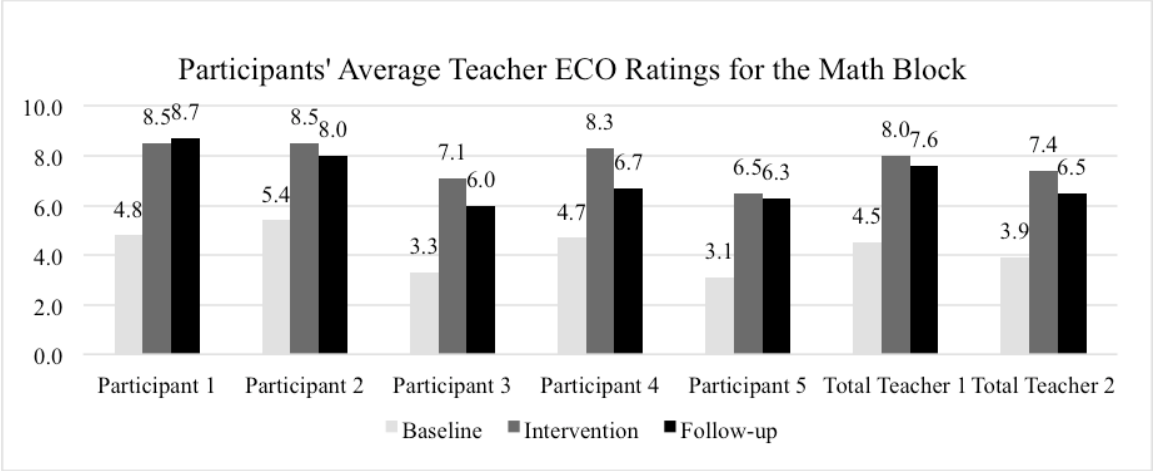


Figure 13 Participants' Average Teacher ECO Ratings for the Math Block Across Study Phases.

7.1, follow-up 6.7; Participant 4—baseline 4.7, intervention 8.3, follow-up 6.7; and Participant 5—baseline 3.1, intervention 8.0, follow-up 7.6.

All of the participants' teacher ratings of on-task behavior increased over time both individually and when averaged during the math block. All participants' teacher ratings of being on task for the math block increased from baseline to follow up. Participant 1's average teacher rating fell slightly above the intervention ratings; all other participants' follow-up teacher ratings fell slightly below their intervention phase but above their baseline ratings. Globally, Teacher 1 and Teacher 2's ratings on the ECO online form were at or below 4.5 out of 10; during intervention it increased to 7.4 and above overall and remained above 6.5 during follow-up ratings. These results answer and satisfy Research Question 5 and show that all participants' on-task teacher ratings from baseline to intervention to 1-week follow up increased over time.

Question 6

Will teacher ratings of participants' on-task behavior for the whole day on the ECO form increase over time?

With regard to being on task for the whole day, teacher ratings collected for the baseline phase using the ECO form averaged 4.6 out of a possible 10 for Teacher 1 and 4.1 out of 10 for Teacher 2. Teacher 1's students were Participants 1, 2, and 3, and Teacher 2's students were Participants 4 and 5. Teacher 1's average rating for the intervention phase was 7.7 and for the follow-up phase was 7.4; Teacher 2's average rating for the intervention phase was 6.6 and for the follow-up phase was 6.9 (see Figure 14).

Participant 1's on-task electronic whole-day teacher rating was 4.8 on average for the baseline phase, and 8.7 for the intervention phase and follow-up phase. Similar ratings for the remaining participants were as follows: Participant 2—baseline 4.6, intervention 7.7, follow-up 7.4; Participant 3—baseline 3.8, intervention 6.4, follow-up 5.7; Participant 4—baseline 5.2, intervention 8.1, follow-up 7.8; Participant 5—baseline 4.1, intervention 6.6, follow-up 6.9.

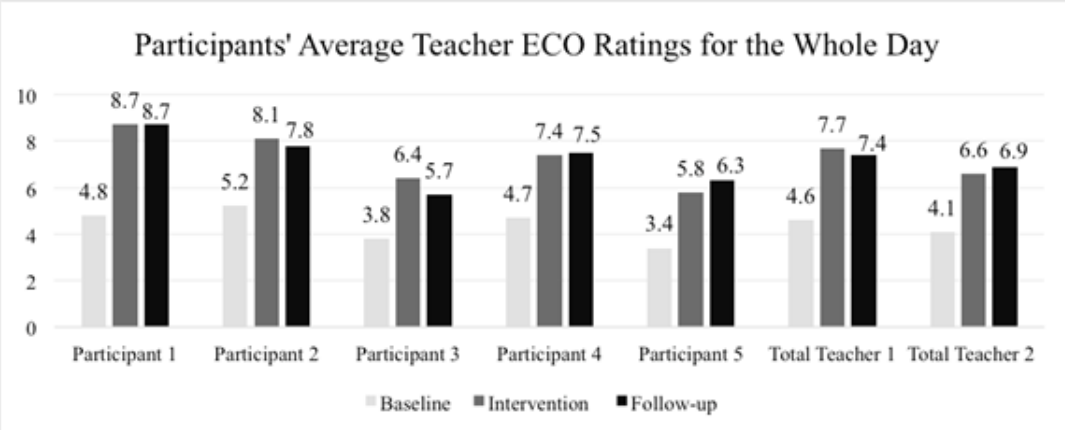


Figure 14 Participants' Average On-Task Teacher Ratings Across All Study Phases

All of the participants' teacher ratings of on-task behavior increased over time both individually and when averaged for the whole day. All participants' teacher ratings increased from baseline to follow-up for the math block on-task rating. Participant 1's average teacher rating remained stable for the intervention phase. Participant 2 and 3's teacher ratings for the whole day were slightly lower from intervention to follow up, and Participant 5 teacher ratings were slightly higher from intervention to follow up. These results answer and satisfy Research Question 6 and show that all participants' whole-day, on-task teacher ratings from baseline to intervention to 1-week follow up increased over time.

Question 7

> Will teacher ratings of participant's optional behaviors for the math period increase on the ECO form over time?

Teachers in the study chose a second optional behavior for each of their participating students, and these were also tracked using the ECO form. Participant 1's optional behavior was to answer questions quickly (within 10 seconds) when asked by the teacher. Participant 2's optional behavior was to follow directions the first time, which was defined as following a direction within 5 seconds of it being given by the teacher. Participant 3's optional behavior was working independently, defined as working with one support or no supports from the teacher within an instructional period. Participants 4 and 5 had the same optional behavior, which was to complete work or an assigned task in a timely manner.

Globally, teacher ratings for the optional behaviors during the math block increased across all study phases, from an average of 4.8 or below during baseline to 8.2

and above during intervention and 7.4 and above during the follow-up phase. Teacher optional-behavior ratings collected during the baseline phase averaged 4.8 out of a possible 10 for Teacher 1 and an average of 3.9 out of 10 for Teacher 2. Teacher 1's students were Participants 1, 2, and 3, and Teacher 2's students were Participants 4 and 5. Teacher 1's average rating for the intervention phase was 8.6 and for the follow-up phase was 7.4; Teacher 2's average rating for the intervention phase was 8.2 and for the 1-week follow-up phase was 7.6 (see Figure 15).

Participant 1's optional behavior (answering questions quickly) teacher rating was 4.8 on average for the baseline phase, 9 for the intervention phase, and 8.7 for the follow-up phase. Similar ratings for the remaining participants were as follows: Participant 2 (following directions)—baseline 5.8, intervention 8.9, follow-up 7.5; Participant 3 (working independently)—baseline 3.8, intervention 7.8, follow-up 6; Participant 4 (completing work)—baseline 4.5, intervention 8.8, follow-up 8.5; Participant 5 (completing work)—baseline 3.3, intervention 7.5, follow-up 6.7.

All of the participants' optional-behavior teacher ratings increased over time both

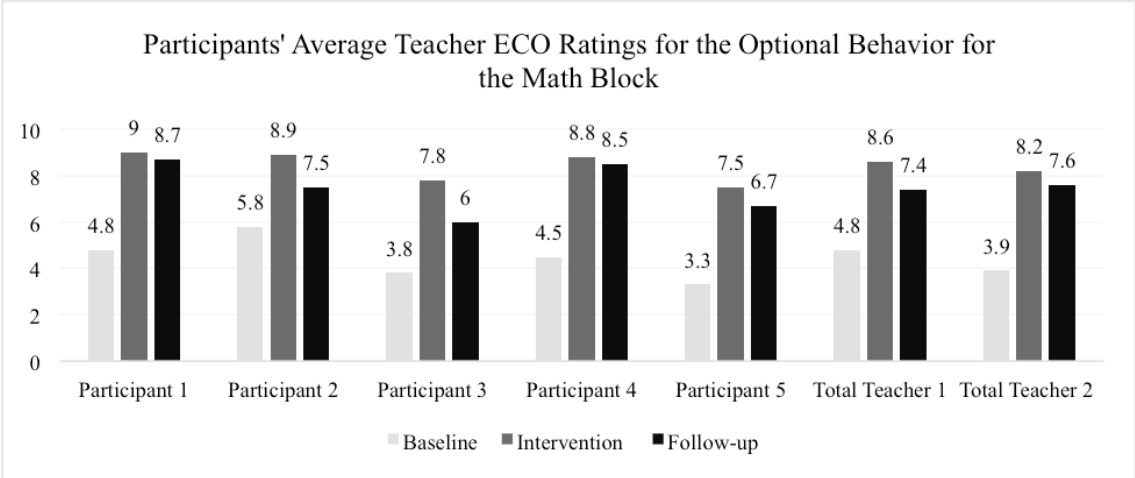


Figure 15 Participants' Average Optional-Behavior Teacher Ratings Across All Study Phases.

individually and when averaged for the math block; they also increased from baseline to follow-up for the math block. In addition, for participants' teacher ECO ratings of their optional behavior from intervention to baseline decreased but remained above baseline levels. These results answer and satisfy Research Question 7 and show that all participants' optional-behavior teacher ratings from baseline to intervention to 1-week follow up increased over time for the math block.

Question 8

> Will teacher ratings of participant's optional behaviors for the whole day increase on the ECO form over time, even when they are not directly reinforced?

Teachers' optional-behavior ratings for the whole day collected using the ECO form for the baseline phase averaged 4.5 out of a possible 10 possible for Teacher 1 and an average of 4.1 out of 10 for Teacher 2. Teacher 1's students were Participants 1, 2, and 3, and Teacher 2's students were Participants 4 and 5. Teacher 1's average rating for the intervention phase was 8.3 and for the follow-up phase was 7.4; Teacher 2's average rating for the intervention phase was 6.9 and for the 1-week follow-up phase was 7.3 (see Figure 16).

Participant 1's optional-behavior electronic whole day teacher rating was 3.8 on average for the baseline phase, 8.8 for the intervention phase, and 8.7 for the follow-up phase. Similar ratings for the remaining participants were as follows: Participant 2—baseline 5.4, intervention 8.2, follow-up 7.5; Participant 3—baseline 4.3, intervention 7.9, follow-up 6; Participant 4—baseline 4.5, intervention 7.7, follow-up 8.5; Participant 5—baseline 3.7, intervention 6, follow-up 6.

All of the participants' teacher ratings of the optional behaviors increased over

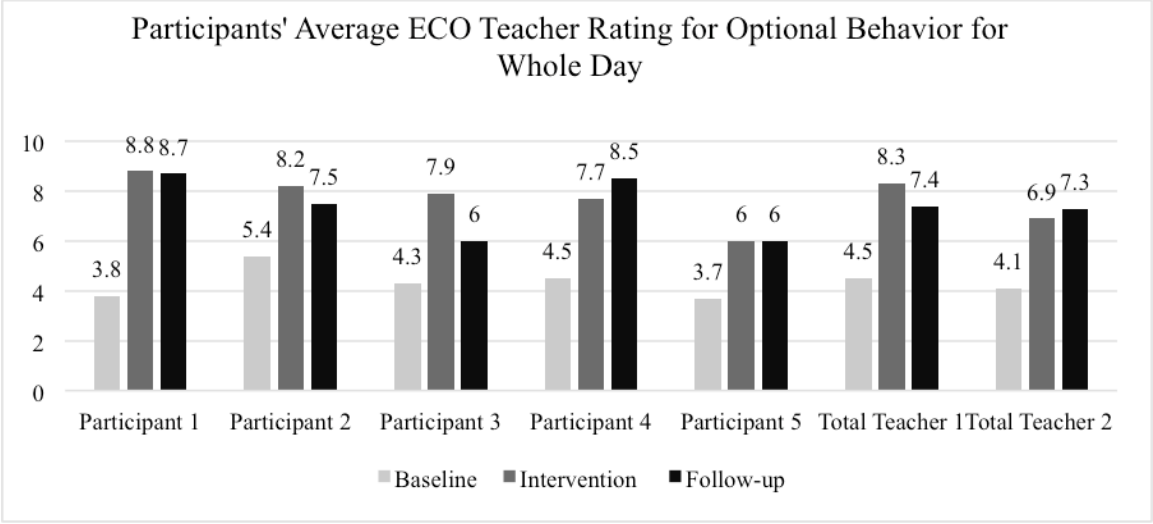


Figure 16 Participants' Average Optional-Behavior Teacher Ratings for the Whole Day Across All Study Phases.

time both individually and when averaged for the whole day; they also increased from baseline to follow-up for the whole-day optional-behavior rating. For Participants 1 and 5, the average teacher rating remained stable from intervention to follow-up, for Participant 4 the rating increased, and for all other participants it decreased but remained above baseline levels. These results answer and satisfy Research Question 8 and show that all participants' optional-behavior teacher ratings from baseline to intervention to 1-week follow up increased over time for the whole day.

Question 9

> Will teacher ratings of participants' behaviors on the Attention Problems, Hyperactivity, and Learning Problems scales of the BASC-3 be significantly different and lower from baseline ratings after the implementation of the ECO intervention?

A paired-samples *t* test with a Bonferroni experiment wise correction was utilized to compare teachers' pre and post BASC-3 ratings for each participant. The scales included in the analysis were the Attention Problems, Hyperactivity, and Learning

Problems scales. The Attention Problems scale included items such as "pays attention," "listens to directions/carefully," "has trouble concentrating," and so forth. The Hyperactivity scale included items such as "is overly active," "has trouble staying seated," "acts without thinking," and so forth. The Learning Problems scale included items such as "has problems with math," "does not complete tests," "has trouble keeping up with class," and so forth. All three of these scales include behaviors that can be observed and coded as being off-task and that might significantly affect academic progress for the student and his or her peers.

Results yielded no significant difference between preintervention mean scores of the BASC-3 teacher ratings and postintervention scores for 4 out of the 5 participants (see Figure 17). For Participant 1, $M = 58.67$, $SD = 9.866$, posttest BASC-3 teacher ratings $M = 52$, $SD = 7$, $t(2) = 3.288$, and $p = 0.0167$. For Participant 2, the analysis yielded no significant differences between the pretest BASC-3 ratings ($M = 58$, $SD = 9.644$) and the posttest BASC-3 teacher ratings ($M = 51.67$, $SD = 6.658$); conditions $t(2) = 3.591$, $p =$

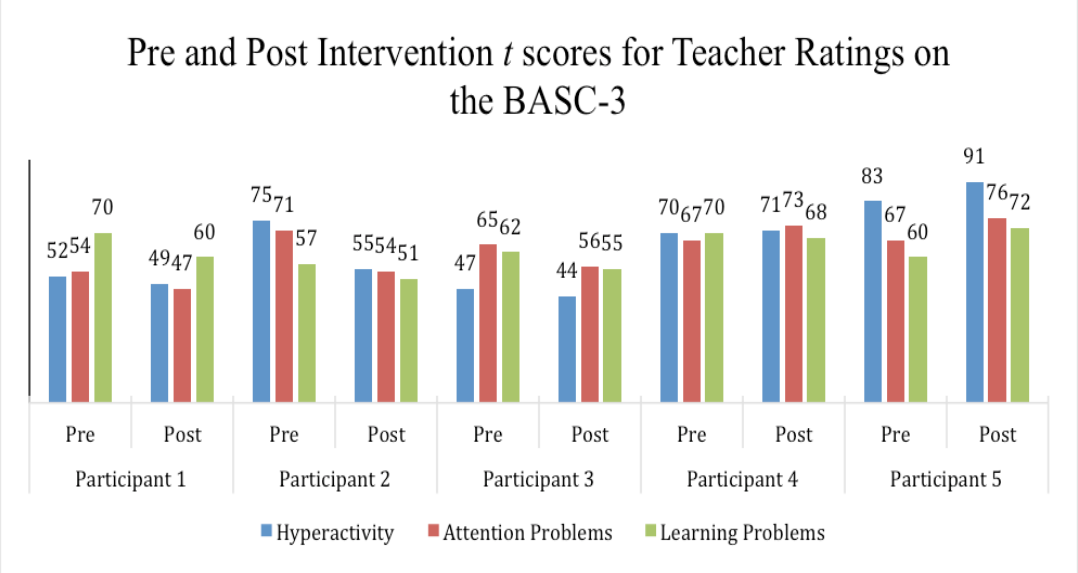


Figure 17 Participants' *t* scores on the BASC-3 Teacher Rating Scale Pre- and Postintervention.

0.0167. For Participant 3, the analysis yielded no significant differences between the pretest BASC-3 ratings (M = 58, SD = 9.644) and the posttest BASC-3 teacher ratings (M = 51.67, SD = 6.658); conditions t(2) = 3.591, p = 0.0167. For Participant 4, the analysis yielded no significant differences between the pretest BASC-3 ratings (M = 69, SD = 1.732) and the posttest BASC-3 teacher ratings (M = 70.67, SD = 2.517); conditions t(2) = -0.714, p = 0.0167. For Participant 5, the analysis yielded a significant difference between the pretest BASC-3 ratings (M = 70, SD = 11.79) and the posttest BASC-3 teacher ratings (M = 79.67, SD = 10.017); conditions t(2) = -8.043, p = 0.0167. This negative score indicates that ratings increased from pre- to posttest periods for Participant 5.

Based on the visual inspection of the *t* scores for participants on the BASC-3 TRS pre- and postintervention, results indicate that most participants' teacher ratings decreased in one or more of the scales utilized. Teacher postintervention ratings for Participant 1 yielded scores that remained within the average range for the Hyperactivity and Attention Problems scales but decreased to the at-risk level for the Learning Problems scale. For Participant 2, the Hyperactivity and Attention Problems *t* scores decreased from the clinically significant levels to the average range at postintervention, with the Learning Problems scale score remaining within the average range. For Participant 3, postintervention *t* scores for the Hyperactivity scale fell within the average range, while the Attention Problems and Learning Problems scores decreased to the average range. For Participant 4, postintervention scores fell within the at-risk range for the Attention Problems scale and within the clinically significant range for the Hyperactivity and Learning Problems scales. Teacher postintervention behavioral ratings

for Participant 5 increased from preintervention levels within the at-risk range to the clinically significant range. These results answer Research Question 9 and show that no statistically significant changes on standardize measures of behavior completed by the teachers were noted from baseline to follow up, with the exception of Participant 5.

Question 10

> Will students' number of problems completed on individualized curriculum-based math worksheets be higher than baseline problem completion after receiving the ECO intervention?

All 5 students completed math worksheets that included 80 randomized addition, subtraction, multiplication, and division problems generated from the Math Worksheet Generator at www.interventioncentral.com. At baseline, participants completed an average of 30 math problems, which was 37% of the items available to complete; this quantity included problems completed correctly and incorrectly within the 15-minute observational period. Problems completed correctly are presented later in this writing. During the intervention phase, participants completed an average of 50 problems (62% of problems completed), which represented a 20-item increase from baseline and a 25-percentage point increase. For all participants the average baseline-to-intervention Tau-U was .70 and the average baseline to intervention IRD was .62. These effect sizes represent a 70% and a 62% improvement across phases, respectively.

At the 1-week follow up, participants completed an average of 51 (64%) problems, which represented a 1% increase from intervention and a 27% increase from baseline. The average baseline-to-follow-up Tau-U for all participants was .72 and the average IRD was .68. These effect sizes represent a 72% and a 68% improvement across phases. See Tables 6 through 8 for each participant's differential effects.

Table 6

Math Problems Completed Across Study Phases

Participant	Baseline	Intervention (Change From Baseline)	Follow-Up (Change From Baseline)
1	36	59 (+27%)	64 (+34%)
2	43	71 (+34%)	61 (+22%)
3	14	34 (+24%)	50 (+44%)
4	35	45 (+13%)	39 (+5%)
5	19	40 (+26%)	43 (+30%)
Total Average	30	50 (+25%)	51 (+27%)

Table 7

Baseline to Intervention Effect Sizes for Math Problems Completed

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	.72	.94	.85	.35	.62	.70
IRD	.65	.85	.70	.40	.36	.62

Note. IRD = Improvement rate difference.

Table 8

Baseline to Follow-Up Effect Sizes for Math Problems Completed

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	1	.4	1	.22	1	.72
IRD	.79	.42	.81	.24	.81	.68

Note. IRD = Improvement rate difference.

Participant 1 completed an average of 36 out of 80 problems on each curriculum-based math worksheet at baseline. During the intervention phase, she completed an average of 59 out of 80 math problems, which represents a 27% increase of the total worksheet completed from the baseline phase. For math problems completed, Participant 1's baseline-to-intervention Tau-U was .72 and her baseline-to-intervention IRD was .65. At the 1-week follow up, she completed an average of 64 out of 80 math problems, which represents a 34% increase of the total worksheet completed from baseline. Her baseline-to-follow-up Tau-U was 1 and her IRD was .79.

Participant 2 completed an average of 43 items out of 80 problems during the baseline phase. He completed an average of 71 problems during the intervention phase, which indicates a 34% increase from baseline to intervention. His math-problems-completed Tau-U from baseline to intervention was .94 and his IRD was .85. During the 1 week follow-up phase, Participant 2 completed an average of 61 math problems of the 80 available on the worksheet, which represents a 22% increase from baseline to follow-up. His baseline-to-follow-up Tau-U was .4 and his IRD was .42.

Participant 3 completed an average of 14 items out of 80 problems during the baseline phase. She completed an average of 34 problems during the intervention phase, which indicates a 24% increase from baseline to intervention. Her math-problems-completed Tau-U from baseline to intervention was .85 and her IRD was .70. During the 1-week follow-up phase, Participant 3 completed an average of 50 math problems of the 80 available on the worksheet, which represents a 44% increase from baseline to follow-up. Her baseline-to-follow-up Tau-U was 1 and her IRD was .81.

Participant 4 completed an average of 35 items out of 80 problems during the

baseline phase. He completed an average of 45 problems during the intervention phase, which indicates a 13% increase from baseline to intervention. His math-problems-completed Tau-U from baseline to intervention was .35 and his IRD was .40. During the 1-week follow-up phase, Participant 4 completed an average of 39 math problems of the 80 available on the worksheet, which represents a 5% increase from baseline to follow-up. His baseline-to-follow-up Tau-U was .22 and his IRD was .24.

Participant 5 completed an average of 19 items out of 80 problems during the baseline phase. He completed an average of 40 problems during the intervention phase, which indicates a 25% increase from baseline to intervention. His math-problems-completed Tau-U from baseline to intervention was .62 and his IRD was .36. During the 1-week follow-up phase, Participant 5 completed an average of 43 math problems of the 80 available on the worksheet, which represents a 27% increase from baseline to follow-up. His baseline-to-follow-up Tau-U was 1 and his IRD was .81.

Results indicate that all participants consistently completed a higher number of math problems on their curriculum-based math worksheets during the intervention and follow-up phases as compared to baseline. On average, there was a 25% increase in math problems completed from baseline to the intervention phase across all participants. Participant 2 had the largest improvement, at 34%, while Participants 1, 3, and 5 had similar improvements ranging from 24% to 27%; Participant 4 had the smallest improvement, at 13%. Tau-U and IRD intervention effect size estimates were moderate to very large.

On average, at the 1-week follow up there was a 27% increase in math problems completed from baseline to the follow-up phase across all participants. Effect sizes for 4

of the 5 participants were moderate to very large. Participant 4's effect size for math problems completed from baseline to follow-up was small. At the 1-week follow up, the average number of problems completed remained above baseline for all participants across the intervention and follow-up phases. These results satisfy Research Question 10 and indicate positive and moderate intervention effects for math work completion.

Question 11

> Will students' number of problems completed correctly on individualized curriculum-based math worksheets be higher than baseline problem completion after receiving the ECO intervention?

All 5 students completed math worksheets that included 80 randomized addition, subtraction, multiplication, and division problems generated from the Math Worksheet Generator at www.interventioncentral.com. At baseline, participants completed an average of 25 math problems correctly, which was 32% of the 80 available problems. This quantity included only problems completed correctly within the 15-minute observational period. During the intervention phase, participants correctly completed an average of 45 problems (57% of problems completed correctly), which represents a 20-item increase from baseline to intervention and a 25% percentage-point increase. For all participants, the average baseline-to-intervention Tau-U was .74 and the IRD was .63. These effect sizes represent a 74% and a 63% improvement across phases, respectively.

At the 1-week follow up, participants completed an average of 48 problems (61%), which represents a 4% increase from intervention and a 29% increase from baseline. The average baseline-to-follow-up Tau-U for all participants was .80 and the average IRD was .66. These effect sizes represent an 80% and 66% improvement across phases, respectively. See Tables 9 through 11 for the differential effects for each

Table 9

Math Problems Completed Correctly Across Study Phases

Participant	Baseline	Intervention (Change From Baseline)	Follow-Up (Change From Baseline)
1	31	53 (+27%)	61 (+36%)
2	39	67 (+36%)	58 (+24%)
3	12	32 (+22%)	49 (+44%)
4	31	43 (+15%)	38 (+7%)
5	11	30 (+23%)	37 (+32%)
Total Average	25	45 (+25%)	48 (+29%)

Table 10

Baseline to Intervention Effect Sizes for Math Problems Completed Correctly

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	.77	0.94	0.89	0.45	.66	.74
IRD	.56	0.85	0.63	0.4	.48	.63

Note. IRD = Improvement rate difference.

Table 11

Baseline to Follow-Up Effect Sizes for Math Problems Completed Correctly

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total
Tau-U	1	0.6	1	0.41	1	.80
IRD	.79	0.29	0.81	0.24	.81	.66

Note. IRD = Improvement rate difference.

participant.

Participant 1 completed an average of 31 out of 80 problems on each curriculum-based math worksheet at baseline. During the intervention phase, she correctly completed 53 out of 80 math problems, which represents a 27% increase over the baseline phase.

For math problems completed correctly, Participant 1's baseline-to-intervention Tau-U was .77 and her IRD was .56. At the 1-week follow up, she correctly completed an average of 61 out of 80 math problems, which represents a 36% increase from baseline. Participant 1's baseline-to-follow-up Tau-U was 1 and her IRD was .79.

Participant 2 correctly completed an average of 39 items out of 80 problems during the baseline phase. He correctly completed an average of 67 problems during the intervention phase, which indicates a 36% increase from baseline to intervention. His math-problems-completed-correctly Tau-U from baseline to intervention was .94 and his IRD was .85. During the 1-week follow-up phase, Participant 2 correctly completed an average of 58 math problems of the 80 available on the worksheet, which represents a 24% increase from baseline to follow up. His baseline-to-follow-up Tau-U was .6 and his IRD was .29.

Participant 3 correctly completed an average of 12 items out of 80 problems during the baseline phase. She correctly completed an average of 32 problems during the intervention phase, which indicates a 22% increase from baseline to intervention. Her math-problems-completed-correctly Tau-U from baseline to intervention was .89 and her IRD was .63. During the 1-week follow-up phase, Participant 3 correctly completed an average of 49 math problems of the 80 available on the worksheet, which represents a 44% increase from baseline to follow-up. Her baseline-to-follow-up Tau-U was 1 and her IRD was .81.

Participant 4 correctly completed an average of 31 items out of 80 problems during the baseline phase. He correctly completed an average of 43 problems during the intervention phase, which indicates a 15% increase from baseline to intervention. His math-problems-completed-correctly Tau-U from baseline to intervention was .45 and his IRD was .40. During the 1-week follow-up phase, Participant 4 correctly completed an average of 38 math problems of the 80 available on the worksheet, which represents a 7% increase from baseline to follow-up. His baseline-to-follow-up Tau-U was .41 and his IRD was .24.

Participant 5 completed an average of 11 items out of 80 problems during the baseline phase. He completed an average of 30 problems during the intervention phase, which indicates a 23% increase from baseline to intervention. His math-problems-completed Tau-U from baseline to intervention was .66 and his IRD was .48. During the 1-week follow-up phase, Participant 5 correctly completed an average of 37 math problems of the 80 available on the worksheet, which represents a 32% increase from baseline to follow up. His baseline-to-follow-up Tau-U was 1 and his IRD was .81.

Results indicate that all participants correctly completed a higher number of math problems on their curriculum-based math worksheets during the intervention and follow-up phases as compared to baseline. On average, there was a 25% increase of math problems completed from baseline to the intervention phase across all participants. Participant 2 had the largest improvement, at 34%, while Participants 1, 3, and 5 had similar improvements, ranging from 24% to 27%. Participant 4 had the smallest improvement, at 13%. Tau-U and IRD intervention effect size estimates were moderate to very large.

On average, at the 1-week follow up, there was a 29% increase in math problems completed correctly from baseline to follow up across all participants. Effect sizes for 4 of the 5 participants were moderate to very large; Participant 4's effect size for math problems completed from baseline to follow up was small. The average number of problems completed correctly remained above baseline for all participants across the intervention and follow-up phases. These results satisfy Research Question 11 and indicate positive and moderate intervention effects for accuracy in math work completion.

Question 12

> Will teachers' ratings of on-task behaviors during independent math seatwork time on the ECO form correlate with on-task rates as measured by direct observations?

Teachers participating in the study completed the ECO form during all phases of the study for each participant. Each teacher's rating of on-task behavior during the 15-minute independent math seatwork time was compared with each participant's observational on-task rate. Teacher ratings were interpreted as a percentage of being on

task (e.g., a rating of 8 on the ECO was interpreted as being 80% on task). To determine the similarity between teachers' ratings of on-task behavior during the math independent seatwork time and the observational rate of on-task behavior, a Pearson Product-Moment Correlation Coefficient (Rogers & Nicewander, 1988) was calculated for each participant and for each teacher across all study phases. Table 12 lists the correlation coefficients for each teacher and participant.

There was a significant positive correlation between Teacher 1's ratings of on-task behavior using the ECO form and results of independent-observation probes: r = .838, n = 48, p < .05. There were significant correlations between Teacher 1's ratings on the ECO forms of all her participants and results of independent-observation probes. There was a significant positive correlation between Teacher 1's rating of Participant 1's on-task behavior and results of independent-observation probes: r = .897, n = 16, p < .05. Teacher 1's ratings of Participant 2's on-task behavior and results of observational probes

Table 12

Pearson Correlation Coefficients for All Participants and Teachers

Participant	Teacher 1	Teacher 2
1	.897[a] (n = 16)	
2	.782[a] (n = 16)	
3	.767[a] (n = 16)	
4		.223 (n = 18)
5		.745[a] (n = 16)
Total	.838[a] (n = 48)	.252 (n = 34)

[a] Significant at the .001 level (2-tailed)

also yielded a significant positive correlation: $r = .782$, $n = 16$, $p < .05$. There was a significant positive correlation between Teacher 1's rating of Participant 3's on-task behavior and results of independent-observation probes: $r = .767$, $n = 16$, $p < .05$. Of all 48 occasions on which Teacher 1's ratings were compared to the results of direct observational data across all 3 of her participants, her ratings fell within one point of the direct observation result in 34 cases, which is 71% of the time.

Although there was a positive correlation between Teacher 2's ratings on the ECO form and the results of the systematic-observations probes ($r = .252$, $n = 34$, $p < .150$), it was not significant at the $p < 0.05$ level of confidence. There was a positive correlation between Teacher 2's rating of Participant 4's on-task behavior and results of independent-observation probes ($r = .223$, $n = 18$, $p < .374$), but this was not significant. Teacher 2's on-task ratings for Participant 5's behaviors and the results of direct observations yielded a significant positive correlation: $r = .745$, $n = 16$, $p < .05$. Teacher 2's ratings were compared to systematic direct observations for 34 occasions. Of those 34 times across both participants, Teacher 2's ratings fell within 1 point of the direct on-task observation result 23 times, which is 68% of the occasions.

Teacher ratings of on-task behavior using the ECO form were significantly positively correlated with results of independent-observation probes across all three phases for Teacher 1, and although positively correlated for Teacher 2, the correlation was not significant. Correlational coefficients exceeded .75 for Participants 1, 2, 3, and 5. There was a positive correlation between Teacher 2's ratings of Participant 4's on-task behavior and results of independent-observation probes; however, this correlation was not significant at the $p = .05$ level.

Each teacher was notified when her ratings for a particular student fell 2 or more points away from the participant's actual on-task rate, but no further training was conducted. For Teacher 1 this occurred in 14 instances and for Teacher 2 it occurred in 11 instances. These results satisfy Research Question 12 and indicate that there were significant positive correlations at the .05 level between data obtained via direct-observation probes and teacher ratings on the ECO form.

Question 13

> Will the average duration of check-out sessions and reinforcement sessions be 50% or less of the minutes recommended in the CICO literature?

During each check-out-only session and reinforcement session the researcher recorded the duration of that session, in minutes and seconds, on the Fidelity Checklist, counting the time from when the participant entered the office to when the participant left the office. During the check-out-only sessions students did not receive any reinforcement; instead, they reviewed their ratings and graphs for the day with the researcher. During the reinforcement sessions participants reviewed their data for the day and used their Chart Moves, Reward Menu, Spinner, and Fun 'O' Meter, in addition to choosing their prize. Average duration times per participant and a total average across all participants were calculated and are presented in Figures 18 and 19.

Average minutes were calculated by dividing the average duration in seconds by 60. The total average duration across all participants for a check-out-only session was 0.90 minutes, which is 54 seconds. The total average duration for the reinforcement sessions across all participants was 2.8 minutes, which is 168 seconds. As seen in the graphs below, some students took longer than others, and most of the time was spent

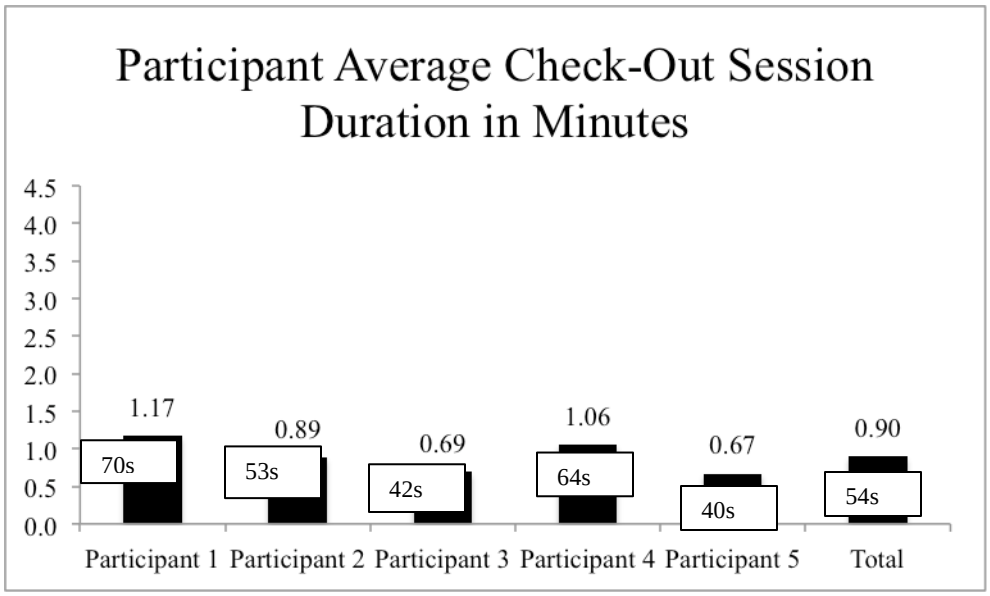


Figure 18 Participant Average Check-Out Session Duration in Minutes and Seconds.

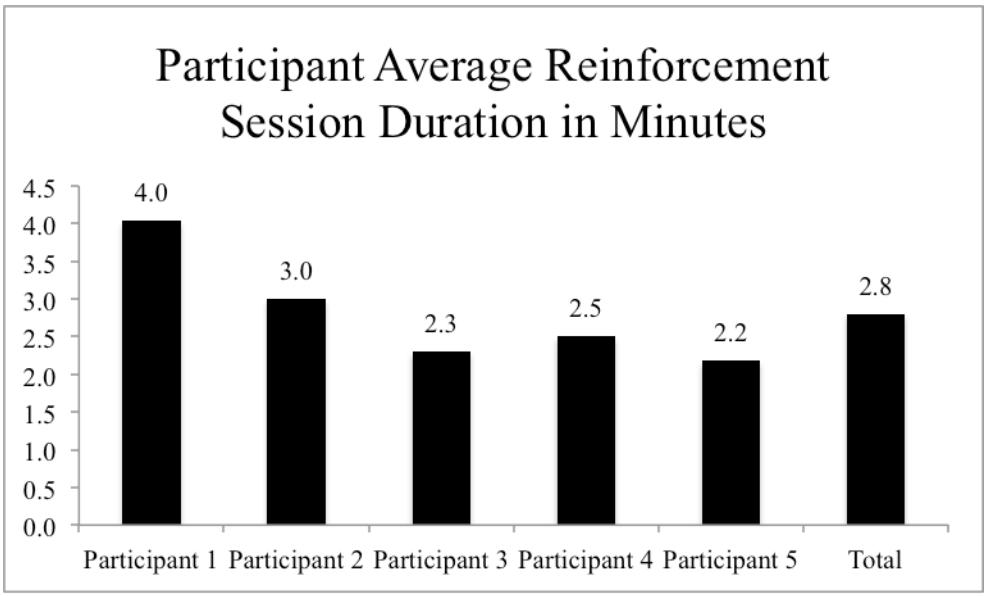


Figure 19 Participant Average Reinforcement Session Duration in Minutes.

trying to decide between options within their Reward Menu number; for example, choosing between two Hot Wheels cars that were both options within their Reward Menu Number 1.

Participant 1's average duration for the check-out-only session was 1.17 minutes, or approximately 70 seconds; her average duration for the reinforcement sessions was 4 minutes. Participant 2's average check-out-only session was .89 minutes, or 53 seconds, and his average reinforcement session duration was 3 minutes. Participant 3's average check-out-only session time was 0.69 minutes, which is 42 seconds; her average reinforcement session duration was 2.3 minutes. Participant 4's average check-out-only session was 1.06 minutes, or 63 seconds, and his average reinforcement session duration was 2.5 minutes. Participant 5's average check-out-only session was 0.67 minutes, or 40 seconds, and his average reinforcement session duration was 2.2 minutes.

Check-out-only and reinforcement session durations were shorter than 5 minutes per participant. Participant 1 had the longest duration across all participants. She was the first participant to come to the office throughout the complete intervention; she enjoyed conversations with the researcher and would often talk about other matters after the ratings were reviewed or after she had obtained her reinforcement.

The literature on the CICO program (Crone et al., 2010; Crone et al., 2004) indicates that the coordinator might take anywhere from 30 to 45 minutes daily to complete the check-ins and check-outs with students. The ECO Program utilizes less than 50% of that time; for example, it took an average of only 15 to 25 minutes daily to complete the check-outs with all 5 participants, and this also included parts to the program that were used only for purposes of completing this dissertation (i.e., the Fun

'O' Meter). Thus, these results satisfy Research Question 13 and indicate that the ECO intervention takes less time to deliver to students than other CICO interventions.

Question 14

> Will teachers maintain a high rate of fidelity of intervention implementation, as measured by the percentage of ECO completed within a week?

During the intervention phase of the study, both teachers completed the ECO forms right after the math block was finished. All participants were from the 3rd-grade; thus, all participants received math instruction and their independent math seatwork time at the same time, which was right before the end of school day. Students were sent to the office at staggered times. Participant 1 was sent 25 minutes before end of school day, and subsequent participants 5 minutes after that. In order for students to review their data and receive their prize, the teacher had to send their ratings before they came to the office; thus, both teachers, during the intervention session, completed the ECO ratings every day right before their first student was sent to the office of the researcher. Research Question 14 is satisfied and indicates that Teacher 1 and Teacher 2 completed 100% of their ECO ratings for each of their participants before sending him or her to the researcher's office.

Question 15

> Will teachers report positive social validity ratings about the ECO intervention on the BIRS, as measured by mean responses on a six-point Likert scale?

Both teachers were asked to complete a social validity questionnaire at the end of the intervention phase and before the follow-up phase began. The questionnaire consisted of 24 statements adapted from Knorr (2015), Lopach (2016), and the BIRS (Elliot & Treuting, 1991). Statements were rated on a six-point Likert-type scale, which ranged

from *Strongly Disagree* to *Strongly Agree* (see Appendix C). Table 13 shows the 24 statements, corresponding responses made by each teacher, and a mean rating. Participants 1, 2, and 3 were in the same class, and Participants 4 and 5 were in the same class; thus, each teacher completed only one questionnaire.

The total mean score for both teachers was 5.04, suggesting that they reported agreeable perceptions of the ECO intervention program as a whole. All of the questionnaire items had ratings of 4 and above, indicating slight to strong agreement with each statement, with the exception of Teacher 2's rating of item 22, which indicated slight disagreement with the statement, "The intervention produced enough improvement in the child's behavior so the behavior no longer is a problem in the classroom." Teacher 2 had Participants 4 and 5.

The teacher social validity questionnaire also contained six open-ended questions designed to allow each teacher to more freely express her perceptions about the intervention. When asked what aspects she liked about the ECO intervention, Teacher 1 stated, "I liked how easy it was to get to the [ECO] rating scale." When asked what she did not like about the intervention, she stated, "I don't like that the students worked on something different [Math CBM forms] from other students." With regard to what she did not like about the ECO online form, she stated, "It was hard to get it done before the students had to go down to get the reward." Teacher 1 indicated that a way to improve this intervention was to "find a way to talk to students after the intervention so that it would carry on afterward."

When asked about what aspects of the intervention she liked, Teacher 2 indicated, "It was very quick to access the form online and respond at the end of the day. Super easy

Table 13

Teacher Intervention Rating Scale Responses

	Statement	Teacher 1	Teacher 2	Mean
1	This was an acceptable intervention for the child's problem behavior.	5	4	4.5
2	Most teachers would find this intervention appropriate for behavior problems in addition to the one addressed.	5	5	5
3	The intervention proved effective in changing the child's problem behavior.	5	4	4.5
4	I would suggest the use of this intervention to other teachers.	6	5	5.5
5	The child's behavior problem was severe enough to warrant use of this intervention.	6	6	6
6	Most teachers would find this intervention suitable for the behavior problem addressed.	5	5	5
7	The intervention did not result in negative side effects for this child.	6	6	6
8	The intervention would be an appropriate intervention for a variety of children.	6	5	5.5
9	The intervention is consistent with other behavioral management techniques I have been taught.	5	5	5
10	The intervention was a fair way to handle the child's off-task behavior.	6	5	5.5
11	The intervention is reasonable for the behavior problems addressed.	6	5	5.5
12	I like the procedures used in the intervention.	4	5	4.5
13	The intervention was a good way to handle the behavior problem.	5	4	4.5
14	Overall, the intervention was beneficial for the child.	5	5	5
15	The intervention quickly improved the child's behavior.	6	4	5
16	The intervention will produce a lasting improvement in the child's behavior.	4	5	4.5
17	The intervention improved the child's behavior to the point that it would noticeably deviate from other classmate's behavior.	6	4	5
18	Soon after using the intervention, a teacher would notice a positive change in the problem behavior.	6	4	5

Table 13 (Continued)

	Statement	Teacher 1	Teacher 2	Mean
19	The child's behavior will remain at an improved level even after the intervention is discontinued.	4	4	4
20	Using the intervention should not only improve the child's problem behavior at school, but also in other settings (e.g., other classrooms, home).	5	5	5
21	When comparing this child with a well-behaved peer before and after the use of the intervention, the child's and the peer's behaviors are more alike after the intervention.	6	4	5
22	The intervention produced enough improvement in the child's behavior so the behavior no longer is a problem in the classroom.	6	3	4.5
23	Other behaviors related to the problem behavior also are likely to be improved by the intervention.	6	4	5
24	I would be willing to use this intervention again with other students in the future.	6	6	6
	Total Mean Rating	5.42	4.67	5.04

Adapted from Elliot and Treuting (1991), Knorr (2015), and Lopach (2016).
Note. Rating scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Slightly Agree; 5 = Agree; 6 = Strongly Agree.

to collect on-going data." She stated that the only thing she did not like was having the students complete the CBM math worksheets every day "while others were doing the regular classwork." Teacher 2 indicated that the only thing she did not like about the ECO online form was "finding one minute without interruptions" at the end of the school day; however, she also stated that the ECO form was "easy to use!"

Teacher ratings on the social validity questionnaire were very positive, although their comments were sometimes contradictory. They mostly reported slightly agreeing to strongly agreeing with the questions in regard to intervention simplicity, suitability, applicability, likelihood of future use, recommendation to other teachers, and decreases in problem behaviors. In the comments sections, the teachers indicated that it was sometimes hard to find time to complete the ECO online form at the end of the school day, but that it was easy to access and use. Results indicate that teachers found the ECO intervention to be a practical, acceptable, and suitable intervention for improving participants' rates of on-task behavior. These results satisfy Research Question 15 and indicate strong positive teacher perceptions of the ECO intervention.

Question 16

> Will student participants report positive social validity ratings on the modified children's intervention rating scale regarding participation in the intervention as measured by mean responses on a six-point Likert scale?

Each participant was asked to complete a social validity questionnaire at the end of the intervention phase. This questionnaire was adapted from Elliot and Treuting (1986) and Lopach (2016). The questionnaire consisted of seven statements that were rated on a six-point Likert-type scale. The scale ranged from *Strongly Disagree* to *Strongly Agree* (see Appendix C). Table 14 shows the seven statements, the responses made by each

Table 14

Children's Intervention Rating Scale Responses

	Statement	P1	P2	P3	P4	P5	Mean
1	Teachers using the CICO forms seemed fair.	6	5	6	6	2	5
2	Reviewing my behaviors with the school psychologist was fair.	6	6	6	6	6	6
3	Having the teacher use the CICO form caused problems with my friends.	4	4	1	4	1	2.8
4	There are better ways to help me to stay focused on my work.	1	5	1	2	5	2.8
5	This would be a good program to use with other kids.	6	6	6	6	6	6
6	I like this program to help me stay focused.	6	6	6	6	6	6
7	I think the CICO intervention helped me do better in school.	6	6	6	6	6	6
	Positively Stated Items Total Mean	6	4.6	6	6	6	5.32
	Negatively Stated Items Total Mean	2.5	4.5	3	1	3	2.8

Adapted from Elliot & Treuting 1986) and Lopach (2016).
Note. P = participant; CICO = check-in/check-out. Rating scale: 1= Strongly Disagree; 2 = Disagree; 3 = Slightly Disagree; 4 = Slightly Agree; 5 = Agree; 6 = Strongly Agree.

participant, and a mean rating.

The total mean rating for positively worded questionnaire items was 5.32, indicating that participants had an agreeable overall perception of the intervention. This score suggests that participants felt that the ECO intervention helped them to stay focused and helped them do better at school. The total mean rating for the negatively worded questionnaire items was 2.8, indicating that students disagreed with the notions that using the intervention caused problems with their peers and that there might be better ways to support them in the classroom. Participant 2 stated that his "pills" were a better way to support him, and Participant 5 stated that "a quieter room" would better help him concentrate. With regard to causing problems with peers, participants commented that

other peers wanted to come to the office to earn prizes.

The participant questionnaire also contained five open-ended questions created to let the students more freely express their thoughts about the intervention and its components. When asked what she liked about the ECO online form and the program as a whole, Participant 1 stated that she liked the intervention because "almost all the days it had good numbers," and because she got to go to the office and earn prizes. Participant 2 had the most negative comments about the ECO form and intervention. He stated that he did not like the ECO online forms because they showed graphs and numbers and that "was weird"; however, he did like reviewing his ratings. Participant 3 stated that she liked that it "teaches you how really good you are" and "if you do great you get to come see [researcher] a lot."

Participants 4 and 5 also stated that the ECO form helped them feel good because they could see their ratings. Participant 4 expressed, "Helps me a lot. When I got a high score it made me happy and confident that I could do it the next time." Both participants also expressed that they loved the reinforcement-day materials and earning their rewards. Participants 2 and 5 were the only ones who expressed negative thoughts about the ECO form, and both said that they did not like it when they received low scores.

Participants' ratings about their thoughts about the intervention were generally positive, as well as their comments. The only aspects of the intervention or program 2 participants did not like were related to seeing their low ratings falling below their on-task goal. These results satisfy Research Question 16, and indicate that participants found the ECO intervention highly acceptable and that it had positive effects on their school experience.

Question 17

Will participants indicate that the office reinforcement sessions they take part in are enjoyable and beneficial to them as measured by their mean responses on the Fun 'O' Meter?

To investigate to what degree participants enjoyed the reinforcement check-out session and how useful they found the session, the Fun 'O' Meter, by Jenson and Sprick (2014), was used. Participants rated the Fun 'O' Meter at the end of each reinforcement day, and ratings were used to monitor participant perceptions about the intervention. Ratings on the Fun 'O' Meter fell within one of five categories, which ranged from least helpful to most helpful. These categories, with their corresponding numerical value, were: No Help (1), Ouch! (2), Getting Better (3), Go For It! (4), and Great (5). A mean rating was calculated for each participant's total ratings. See Table 15 for each participant's mean Fun 'O' Meter rating throughout the intervention phase.

Results indicate that participants' average rating of reward days was 4.75. All participant ratings on the Fun 'O' Meter across all reward days were at or above a 3; this

Table 15

Average Participant Fun 'O' Meter Rating

Participant	Average Rating
1	5.0
2	4.5
3	4.6
4	4.8
5	4.8
Total Average	4.75

(Jenson & Sprick, 2014)

Note. Rating scale: 1 = No Help; 2 = Ouch!; 3 = Getting Better; 4 = Go For It!; 5 = Great!

indicates that participants had positive perceptions about all reward days throughout the intervention phase. In cases in which they rated the session as a 3, most participants had not met their on-task goal for the day or did not have a dot appear on their Chart Moves Board. Although all participants completed their individualized Chart Moves Board, only 4 of the 5 participants earned their large reinforcer during the final week of the intervention phase. Participant 5 came to all of his check-out sessions but struggled to obtain a rating of 7 or above for his on-task behaviors; thus, he could color-in half of the square but could not achieve more than 80% of the square halves colored-in, which was the requirement to obtain the larger prize. These results satisfy Research Question 17, and indicate that participants perceived reward days as both highly enjoyable and useful.

Interobserver Reliability

To ensure interobserver reliability, the research assistants engaged in observation training sessions, as previously described. The research assistants watched the training videos and practiced performing direct observations using a momentary time sampling response discrepancy format. Practice systematic direct observations were repeated until the research assistants became fluent with the observation procedure and a minimum Cohen's Kappa of .80 was achieved in at least two out of three observations. An agreement-plus-disagreement model was also calculated. See Table 16 for mean interobserver reliability coefficients for the observation training videos.

Of the observation probes collected throughout all study phases, approximately 45% were assessed for interobserver reliability. Both Cohen's Kappa and an agreement-plus-disagreement model were calculated for each simultaneous observation. A Cohen's Kappa reliability coefficient of .846 was achieved between the independent observers

Table 16

Mean Interobserver Reliability Coefficients for Training Videos

Measure	Assistant 1	Assistant 2	Assistant 3
Cohen's Kappa	0.941	0.919	0.93
Agreement + Disagreement	0.836	0.756	0.794

Note. All observers achieved a Kohen Kappa of more than .80 for two out of three videos.

across all simultaneous observations. An agreement-plus-disagreement reliability coefficient of .936 was achieved across all simultaneous observations. See Table 17 for the reliability coefficients for each participant.

Treatment Fidelity

The researcher used treatment-fidelity checklists to ensure that research sessions were implemented with integrity. The researcher checked off each step as it was completed during each parent, teacher, and student orientation session and reward day. Based on these fidelity checklists, research sessions were delivered with 100% fidelity.

Table 17

Interobserver Reliability Across Study Phases

Measure	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Total Average
Cohen's Kappa	.79	.93	.76	.85	.90	.846
Agreement + Disagreement	.90	.97	.91	.94	.96	.936

DISCUSSION

Introduction

In a recent cost-effectiveness study completed by the Washington State Institute for Public Policy (2016), check-in behavior interventions (i.e., CICO, BEP, C&C, CCE) were found to have a 45% chance of their benefits surpassing their costs. The results of the Institute's meta-analysis showed that costs of the check-in interventions varied by the people implementing them (e.g., paraprofessionals vs. counselors), and that effect sizes for externalizing behaviors were small. However, CICO intervention is a widely used Tier 2 PBIS for reducing problematic behaviors and increasing positive behaviors, academic engagement, and attendance (Hawken et al., 2014; Maggin et al., 2015; Wolfe et al., 2015).

The CICO intervention is derived from and follows the steps of the BEP (Crone et al., 2010). Students who have been identified as being at risk for behavioral difficulties or attendance issues are referred to the CICO coordinator. The coordinator meets with the school team, parents, and students and starts the CICO intervention. The intervention uses a DRC that is completed by teachers and reviewed by the CICO coordinator and the parents. A points-earned goal of 80% is established. Students can earn rewards for goal attainment, although most often adult praise and attention is the reward provided. It is usually offered to 15 to 20 students served by a coordinator, who gathers and graphs data, prepares the paper DBRC forms, and communicates with home and school. The

coordinator then monitors student data and refers for continuity of intervention, fading, termination, or more supports within the school PBIS framework.

Within the PBIS framework, the CICO intervention has been used to support students at risk of developing more chronic behavioral difficulties. The CICO intervention follows the critical features of a Tier 2 intervention by having systematic training, referral, and implementation procedures, is quick to implement and continually available, utilizes the school's expectations, is monitored consistently, is easily modifiable, and is used for data-based decision making (Hawken et al., 2009; Yong & Cheney, 2013). As a Tier 2 intervention, the CICO provides early preventive support to students to reduce the need for more expensive and intensive interventions in the future (Wolfe et al., 2015).

The CICO intervention has been widely studied, and several meta-analyses on its effectiveness have been completed, with effect sizes falling within the small (i.e., $d = .37$) to large level (i.e., $R^2 = .23$; Hawken et al., 2014). Wolfe et al. (2015) showed that the CICO intervention is an evidence-based Tier 2 intervention for problematic behavior primarily driven by adult attention; however, the authors also showed that the effectiveness of the CICO in increasing academic behaviors and behaviors maintained by other functions is not conclusive. Maggin et al. (2015) concluded that although single-subject research data show sufficient evidence for CICO to be deemed an EBI per WWC standards, group-based intervention data do not. In addition, Hawken et al. (2014) showed that across elementary and secondary schools, typically implemented CICO interventions had moderate effect sizes in reducing problematic behavior and increasing appropriate behaviors in students at risk for emotional and behavioral disorders.

Based on the current literature and studies on cost effectiveness of the CICO intervention, a call for component analyses is important. Maggin et al. (2015) found that parental signatures and check-outs were not implemented with fidelity. Campbell and Anderson (2011) demonstrated positive effects when only one teacher feedback session was utilized. Furthermore, studies that utilized reinforcement systems with typical CICO intervention showed improved results for students (Barber, 2013; Miller, Dufrene, Olmi, et al., 2015). However, there have not been studies in which meetings with the CICO coordinator are decreased, a unique reinforcement system is in place, and electronic forms are used rather than paper forms. In addition, in previous studies the CICO coordinator still sent forms for parental signatures and requested parental social reinforcement.

Study Findings

The purpose of this research study was to enhance and extend the literature on CICO interventions and their individual components. In the current study the researcher attempted to (a) demonstrate the effectiveness of an ECO system to increase on-task rates, (b) investigate whether using only a check-out intervention without parental involvement is as effective as a typical CICO system, and (c) include a unique and variable motivational system to increase student buy-in and success. The study was conducted with five 3rd-grade students at one public elementary school. The study also evaluated the effects on a teacher-selected optional behavior, math problem completion and accuracy, and the amount of time required to complete a check-out session. Teacher on-task ratings on the ECO form were compared to direct observational data for similarity of ratings. Teacher and participant feedback and social validity ratings were

also evaluated.

Results showed that the ECO intervention program increased participants' observed on-task rates, which were comparable to those demonstrated by classroom peers not participating in the study. At baseline, the average rate of on-task behavior for all participants was 47%, while comparison peers obtained an average on-task rate of 73%. During the intervention phase, however, participants obtained an average on-task rate of 78%, and comparison peers obtained an average on-task rate of 79%. The participants' intervention on-task rate indicates a 31% increase from baseline to intervention. Although the average baseline-to-intervention Tau-U was .96 and the average IRD was .82, indicating large-to-very-large intervention effects for on-task rates, 2 out of 5 participants showed unclear effects due to a baseline upward trend (Parker et al., 2009; Vannest & Ninci, 2015). However, when baseline trend was controlled with the Tau-U calculations, effect sizes decreased and fell within the moderate-to-large range for the specific participants. Follow-up data were collected during the last week of school. All participants also showed increased rates of on-task behavior during the 1-week follow-up phase as compared to baseline rates, although some participants obtained slightly lower rates as compared to their intervention rates.

Teachers' ratings of all participants' on-task rates increased over the intervention phase and remained higher than baseline rates during the follow-up phases for both the math block and the whole day. Teachers' ratings on the optional behaviors, behaviors that were not directly reinforced during the study, also increased for all participants over time for the math block and the whole day. Correlational data for teacher ratings on the ECO form and direct-observation rates were at or above .70 and significant at the 0.05 level for

Teacher 1 and all 3 of her students. Teacher 2's ratings were significant only for 1 of her two participants. Although there was no statistically significant change for teacher pre and post ratings on the BASC-3 TRS for 4 out of 5 participants, visual data indicate that teacher ratings decreased at least one level (e.g., from at-risk to average) for 3 out of 5 participants, and for 1 participant remained at the same level.

Results showed that the ECO intervention program produced increased rates of math problem completion and accuracy for all participants. Data show that on average, there was a 25% increase in the number of problems completed and the number of problems completed correctly from baseline to intervention. The average baseline-to-intervention Tau-U and IRDs fell at or above .62 for problems completed and problems completed correctly, indicating moderate-to-large intervention effects. On average, participants' 1-week follow up number of problems completed and number of problems completed correctly also increased from intervention, and remained higher than baseline rates.

Results show that the ECO intervention uses 50% less time than a typical CICO intervention, which makes it more time- and cost effective. On average, a check-out session that did not include reinforcement lasted about 54 seconds, while a reinforcement session (i.e., a check-out session with reward components) lasted an average of 2.8 minutes. Compared to the 30–45 daily minutes recommended for CICOs in an average CICO intervention, this intervention utilized almost 50% less time, about 15 to 25 minutes daily.

Results of the ECO intervention program showed adequate and positive social validity. Participants' ratings indicate that they found the reinforcement sessions to be

enjoyable and beneficial, and the intervention as a whole to be positive and acceptable. Teacher social validity ratings were positive, and indicate that they found the ECO intervention program to be simple, suitable, and applicable for future students.

Relation to Previous Research

The results of the ECO intervention extend and enhance the CICO research literature on effectiveness of program components in increasing on-task behavior and academic engagement. The ECO intervention achieved effect sizes comparable to and sometimes higher than those obtained through a typical CICO intervention, with fewer program components and a unique reinforcement system. Results of this study yielded large effect sizes for on-task rates (i.e., above .60) compared to those found by Wolfe et al. (2015) when using modified versions of the CICO, and larger than the effect sizes obtained by Hawken et al. (2007) in their BEP study and Hawken et al. (2014) in their meta-analysis of CICO interventions. The ECO intervention obtained double the effect sizes observed in the literature, utilizing half the time—and thus half the cost—of a typical CICO intervention. These results extend and enhance the research literature on modified versions of the CICO intervention that used direct behavioral observations as a dependent measure to decrease problematic behavior and increase academic engagement (Campbell & Anderson, 2011; Todd et al., 2008).

The ECO intervention program used fewer components than a typical CICO intervention. Maggin et al. (2015) recommended more studies to evaluate the efficacy of components crucial for intervention. The ECO intervention did not require parent signatures as a component of intervention, and conducted only check-out sessions. In addition, the ECO Program used online forms that were easily and quickly accessed by

teachers, further reducing program cost. In this regard, the ECO Program followed the guidelines proposed by Bowen, Jenson, and Clark (2004) for research-based effective interventions that have a greater probability of being used by classroom teachers.

The ECO Program is a compound package-ready intervention that uses research-based components, is time and cost effective, is simple to create and implement, is positive, and is agreeable for students and teachers. The ECO Program provided teachers with an intervention that required very little time to create (start time) and implement (run time), as recommended by Elliot (1988), and Bowen et al. (2004). The ECO intervention provides teachers with ready-made electronic forms that can be easily modifiable for students, and record and graph data in real time. Furthermore, because it is an online form, it further decreases the complexity of creation and implementation. Teachers can access forms through their computers, phones, or tablets with the use of a link, and complete the form within seconds.

The ECO Program efficiently uses free technology and reduces the amount of resources assigned to manage behavior at the individual, classroom, and whole-school levels. The use of online forms decreases paperwork, which is in accordance with a directive from the *No Child Left Behind Act of 2001* and the *Individuals With Disabilities Education Act* (2006), and uses technology that is available and increasingly being used by teachers in classrooms. As an electronic intervention, the ECO Program decreases the amount of money teachers spend in their classrooms and for their students. The ECO, if implemented with paraprofessionals and used as a Tier 2 intervention, will help in decreasing the use of other school resources, especially the personnel involved when student misbehavior is not managed, and thus, cost for the school.

The ECO intervention is a positive, simple intervention aligned with the procedures for interventions utilized in a school-wide positive behavioral support framework. As presented in the behavioral literature (Ferster & Skinner, 1957; Skinner, 1974), the use of a contingent variable ratio of reinforcement supported higher rates of response by the students. The use of a unique motivational reinforcement system in the ECO Program had positive effects on students' behaviors and they found the experience enjoyable, as measured by social validity data. Miller, Dufrene, Olmi, et al. (2015) found that when a unique motivator was added to a student's CICO program, his appropriate behaviors increased more than what had been observed with CICO alone. Furthermore, Barber (2013) showed that the use of additional incentives improved intervention results for 1 student who was not responding to a typical CICO.

The ECO intervention extends Campbell and Anderson's (2011) findings on program components. The authors reduced the amount of teacher feedback students received, while still meeting with the coordinator in the morning and the afternoon. Campbell and Anderson found that at least one teacher feedback session, in combination with the morning check-in and the afternoon check-out sessions, and parent involvement with the point card were needed for better results. In the current study, large effect sizes were achieved when teacher feedback to participants was provided at the end of the day combined with only one check-out session with the coordinator, and no parental involvement. Furthermore, the ECO intervention produced increases in the optional behaviors of students that were not directly reinforced during the intervention.

For the ECO intervention, students were reinforced only for achieving their goal on the on-task-behavior teacher ratings and going to the check-out sessions. However,

teachers also rated students on an individually selected optional behavior that was reviewed with the students but not directly reinforced. What this study revealed is that when students' on-task teacher ratings increased, their teacher ratings for the secondary optional behavior increased as well. Furthermore, students' math problem completion and accuracy rates also increased.

These results further extend the research by Ducharme and Shecter (2011) on keystone behaviors. In the current study, supporting students in increasing their on-task behavior also supported their increases on a secondary optional behavior (e.g., completing work in a timely manner, responding appropriately and quickly, and so forth) and on academic achievement (i.e., math problem completion and accuracy), which were not directly reinforced. Moreover, these generalizations to other nonreinforced behaviors and academic improvements were observed not only for the math-time ratings but also for the whole-day ratings.

The ECO Program followed a call for more robust social-validity single-subject research made by Spear, Strickland-Cohen, Romer, and Albin (2013). The authors showed that many of the single-subject-research-design studies used for the analysis "did not address social validity explicitly, [while] half met all of the quality indicators" proposed by Horner et al. (2005; Spear et al., 2013, p.363). The ECO Program followed many of the quality indicators and measures of social validity of single-subject research proposed for students identified as having or being at risk for emotional and behavioral disorders. In addition to the quality components and teacher and student social-validity questionnaires, students' Fun 'O' Meter ratings provided the researcher with an immediate assessment of how enjoyable the intervention was and what other steps, if any,

could be taken if ratings were low. The Fun 'O' Meter was a more consistent and recurrent measure of social validity, than a post intervention rating scale that enhanced student engagement and results by providing in vivo assessment of participants' perceptions.

Study Limitations

The current research study had several limitations that need to be considered for future research. First, there were a small number of participants from one public elementary school, and all were enrolled in the 3rd grade; therefore, results have limited generalizability to other students from diverse backgrounds, grades, and educational settings. Furthermore, teachers rated their students only for the math independent seatwork time and for the whole day; thus, results may have limited generalizability across academic subjects and particular times of day or activities.

A second limitation involves practice effects. During the study, participants completed curriculum-based math worksheets that contained items measuring 3rd-grade computation problems. The repetition of completing the worksheets across study phases, and increased skills through the passage of time and instruction, may have impacted the intervention effects for math-work completion and accuracy.

A third limitation involves teacher and participant reactivity effects during observational periods. The researcher and research assistants conducted observations during participants' math independent work time in each classroom throughout study phases. During the baseline phase, participants were not aware of any study components; however, baseline data were not stable for participants, and on occasion showed an ascending or descending trend. Nonetheless, 4 out of the 5 participants obtained average

baseline on-task rates that fell at or below 60%, and the fifth participant obtained an average on-task score of 65% at baseline.

During the intervention phase, participants became familiar with the researcher during reward days and had knowledge of their participation in the study. This knowledge might have altered their behavior during observational periods in their classroom. In addition, the presence of the observer during these time blocks might have altered teacher behaviors, and thus teacher ratings of students' behavior. It should be noted, however, that a multiple-baseline research design was used to minimize this possibility, and teacher ratings were significantly positively correlated with results of independent direct observations for 4 out of 5 participants.

A fourth limitation is parental awareness of the intervention, and praise for efforts. In this intervention, parents did not receive their child's ratings and were asked not to talk about or praise their students' efforts; however, parents were not contacted and data were not gathered to assess this possibility. Parental social reinforcement, if offered, might have altered the extent to which intervention effects generalized.

A fifth limitation is the lack of fading procedures, and the short delay between intervention and follow-up data collection due to time constraints. There was only a week between intervention termination and follow up. The lack of gradual fading of intervention, as recommended by Crone et al. (2010), might have impacted the extent to which intervention effects would generalize over longer periods of time.

A sixth limitation is the amount of time the participants were in the intervention. This intervention, as recommended in the MTSS model for the district's Tier 2 interventions, was offered for only 4 to 5 weeks before follow-up procedures started.

Although on average, for 3 of the 5 participants' teacher ECO ratings fell at or above goals, scores might not have been consistently above this score for all participants for at least 80% of the complete 4 to 6 weeks of intervention before intervention was terminated.

A seventh limitation was the absence of teacher training after the start of the study. Although the researcher reported to the teachers when their daily on-task ratings had fallen 2 or more points above or below the on-task rate obtained through direct observations, no booster training sessions were offered. This lack of further training in observation and rating procedures might have impacted the accuracy of teacher ratings on days when observations were not conducted. It is important to note that Teacher 1's ratings were positively and significantly correlated, on average, to the direct observations during the intervention phase. Teacher 2's ratings were not significantly correlated, on average, but were significantly correlated for 1 of her 2 students.

An eighth limitation is that the primary researcher conducted most of the observations. Familiarity with students might have impacted observations when interobservers were not present; however, interobserver agreements were above .80 for Kappa and agreement plus disagreement.

A ninth and final limitation is that the ECO intervention program is a compound, package-ready intervention; thus, effectiveness of particular components could not be assessed. However, the ECO intervention follows the recommendation made by Bowen et al. (2004) for effective interventions, and its components are research-based.

Future Research

Results of this study add to and expand the current research-based literature on interventions in schools. As such, the results and limitations presented provide starting points for further expansion and research. In order to better understand generalization effects, future research on the ECO intervention should include participants from all grade levels and students of diverse ethnic and cultural backgrounds living in rural areas or participating in specialized classroom settings. Future research might evaluate the effectiveness of the ECO intervention utilizing paraprofessionals as coordinators, and with larger groups of students considered to be at risk for behavior difficulties within a Tier 2 model of supports. To reduce reactivity effects, observations could be recorded and then coded, which could also help reduce classroom intrusion.

Future researchers may wish to examine the efficacy of the ECO intervention with other academic subjects, reinforcing more than one behavior and including academic performance across multiple time periods. Specifically, as considered best practice, future research could examine the efficacy of the ECO intervention to monitor two or more behaviors over several short time periods across the entire day (Chafouleas et al., 2005; Riley-Tillman, Christ, Chafouleas, Boice-Mallach, & Briesch, 2011; Volpe & Fabiano, 2013). Furthermore, future researchers can study the efficacy of this intervention utilizing strategic, shorter periods of time in which being on task is reportedly difficult for a particular student.

Additionally, future studies could follow the recommendations by Crone et al. (2010) in utilizing fading procedures and implementing the intervention for longer periods of time. Future researchers may wish to investigate generalization of intervention

effects by having self-monitoring fading procedures, monitoring behavior weekly or periodically, or transitioning to more global school-behavioral expectations. In future studies, researchers might want to incorporate teacher booster sessions when their ratings do not match observation data, to improve intervention implementation, student success, and generalization effects in both research and practice. Finally, future researchers might want to evaluate the effectiveness of the ECO components individually, to further enhance the literate with more cost- and time-efficient school strategies.

APPENDIX A

SYSTEMATIC OBSERVATION FORM

Tough Kid Tool Box

REPRODUCIBLE 7-8

Behavior Observation Form

Target Student _____ M/F _____ Grade _____

School _____ Teacher _____ Date _____

Observer _____ Position _____

Class Activity _____

❑ Teacher-directed whole class ❑ Teacher-directed small class ❑ Independent work session

DIRECTIONS: Each box represents a ten-second interval. Observe each student **once**, then record the data. This is a partial interval recording. If possible, collect data for the full 15 minutes under a teacher-directed or independent condition. If this is not possible, put a slash when the classroom condition changes. **Classmates observed must be the same sex as the target student.**

	1						2						3					
Target Student																		
Peer*																		
	4						5						6					
Target Student																		
Peer*																		
	7						8						9					
Target Student																		
Peer*																		
	10						11						12					
Target Student																		
Peer*																		
	13						14						15					
Target Student																		
Peer*																		

*Randomly selected classmate of the same sex

NOTE: To observe class, begin with the first same-sex student in row 1. Record each subsequent same-sex student in following intervals. Data reflect an average of classroom behavior. **Skip unobservable students.**

ON-TASK CODES: Eye contact with teacher or task and performing the requested task.

OFF-TASK CODES:

T = **Talking Out/Noise:** Inappropriate verbalization or making sounds with object, mouth, or body.
O = **Out of Seat:** Student fully or partially out of assigned seat without teacher permission.
I = **Inactive:** Student not engaged with assigned task and passively waiting, sitting, etc.
N = **Noncompliance:** Breaking a classroom rule or not following teacher directions within 15 seconds.
P = **Playing With Object:** Manipulating objects without teacher permission.
\+ = **Positive Teacher Interaction:** One-on-one positive comment, smiling, touching, or gesture.
\- = **Negative Teacher Interaction:** One-on-one reprimand, implementing negative consequence, or negative gesture.
/ = **Neutral Teacher Interaction:** One-on-one expressionless teacher interaction, no approval or disapproval expressed, directions given.

See pp. 121 and 122 for suggestions for use.

APPENDIX B

CURRICULUM-BASED MATH WORKSHEETS

!

Curriculum-Based Assessment Mathematics
Single-Skill Computation Probe: Student Copy

Student: Date: _____

31 +47	67 +20	24 +73	72 +20	53 +25	10 +67
32 +66	38 +40	21 +27	62 +22	64 +11	27 +61
67 +21	56 +31	27 +50	31 +34	20 +68	35 +63
47 +30	41 +46	12 +65	41 +45	30 +58	27 +60
76 +23	22 +54	10 +57	33 +24	22 +62	51 +26

APPENDIX C

QUESTIONNAIRES

Intervention Rating Scale

Adapted from the BIRS (Elliot & Trueting, 1991)

Please evaluate the intervention by circling the number which best describes your agreement or disagreement with each statement. You must answer each question.

1= Strongly Disagree 2= Disagree 3=Slightly Disagree
4= Slightly Agree 5= Agree 6= Strongly Agree

1	This was an acceptable intervention for the child's problem behavior.	1 2 3 4 5 6
2	Most teachers would find this intervention appropriate for behavior problems in addition to the one addressed.	1 2 3 4 5 6
3	The intervention proved effective in changing the child's problem behavior.	1 2 3 4 5 6
4	I would suggest the use of this intervention to other teachers.	1 2 3 4 5 6
5	The child's behavior problem was severe enough to warrant use of this intervention.	1 2 3 4 5 6
6	Most teachers would find this intervention suitable for the behavior problem addressed.	1 2 3 4 5 6
7	The intervention did not result in negative side effects for this child.	1 2 3 4 5 6
8	The intervention would be an appropriate intervention for a variety of children.	1 2 3 4 5 6
9	The intervention is consistent with other behavioral management] techniques I have been taught.	1 2 3 4 5 6
10	The intervention was a fair way to handle the child's off-task behavior.	1 2 3 4 5 6
11	The intervention is reasonable for the behavior problems addressed.	1 2 3 4 5 6
12	I like the procedures used in the intervention.	1 2 3 4 5 6
13	The intervention was a good way to handle the behavior problem.	1 2 3 4 5 6
14	Overall, the intervention was beneficial for the child.	1 2 3 4 5 6
15	The intervention quickly improved the child's behavior.	1 2 3 4 5 6
16	The intervention will produce a lasting improvement in the child's behavior.	1 2 3 4 5 6
17	The intervention improved the child's behavior to the point that it would noticeably deviate from other classmate's behavior.	1 2 3 4 5 6
18	Soon after using the intervention, a teacher would notice a positive change in the problem behavior.	1 2 3 4 5 6
19	The child's behavior will remain at an improved level even after the intervention is discontinued.	1 2 3 4 5 6

20	Using the intervention should not only improve the child's problem behavior at school, but also in other settings (e.g., other classrooms, home).	1 2 3 4 5 6
21	When comparing this child with a well- behaved peer before and after the use of the intervention, the child's and the peer's behaviors are more alike after the intervention.	1 2 3 4 5 6
22	The intervention produced enough improvement in the child's behavior so the behavior no longer is a problem in the classroom.	1 2 3 4 5 6
23	Other behaviors related to the problem behavior also are likely to be improved by the intervention.	1 2 3 4 5 6
24	I would be willing to use this intervention again with other students in the future.	1 2 3 4 5 6
25	Which aspects of this intervention did you like?	
26	What, if anything, you did not like about this intervention?	
27	What did you like about the ECO form?	
28	What didn't you like about the ECO form?	
29	What can be improved about this intervention?	
30	Other comments?	

Children's Intervention Rating Scale
Adapted from the CIRS (Elliot, 1986)

Name: _____ Date: _____

Please circle how you feel about each question.

1 = Strongly Disagree
2 = Disagree
3 = Slightly Disagree
4 = Slightly Agree
5 = Agree
6 = Strongly Agree

1	Teachers using the ECO forms seemed fair.	1 2 3 4 5 6
2	Reviewing my behaviors with the school psychologist was fair.	1 2 3 4 5 6
3	Having the teacher use the ECO form caused problems with my friends.	1 2 3 4 5 6
4	There are better ways to help me to stay focused on my work.	1 2 3 4 5 6
5	This would be a good program to use with other kids.	1 2 3 4 5 6
6	I like this program to help me stay focused.	1 2 3 4 5 6
7	I think the ECO intervention helped me do better in school.	1 2 3 4 5 6
8	What did you like about the ECO form?	
9	What didn't you like about the ECO form?	
10	What did you like about the program?	
11	What didn't you like about the program?	
12	What can we do better next time?	

APPENDIX D

FUN ‘O’ METER

Date:_____ Subject:_____

Great!

Go For It!

Getting Better

Ouch!

No Help

APPENDIX E

GUIDELINES TO CREATE THE ECO FORM

Guidelines to Creating the ECO from the Google Forms Application

(Adapted from the guidelines created by Jamie Knorr, 2015)

1. Create a Google account by accessing http://www.google.com and clicking Sign In
2. Click "Create an account"
3. Follow the steps to create a Google account
4. Access your Google Drive at http://drive.google.com
5. Click the "New" button and click on "More" and then click "Google Form"
6. Create a title by replacing "Untitled form" with the desired title
    a. For the purpose of the study, the researcher created the title Electronic Check-Out Form
7. Replace "Untitled Question" with "On-Task"
    a. Change the "Question type" scroll menu to "Multiple Choice Grid"
    b. Change the Row 1 label to "Math Block"
    c. Change the Row 2 label to "Whole Day"
    d. In Column 1 write "(0) 0%"
    e. In Colum 2, write "(1) 10%"
    f. Follow steps d and e in multiples of 10 until you reach "100%"
    g. Click on the "Required question" button
8. Click the copy question symbol,
9. Replace "On-task" for "Optional Teacher Behavior #1"
10. On the right corner of the question click on the plus sign to add another question.
11. Replace "Question" with "Comments"
12. The question is automatically a text answer question.
13. At the top of Form click on the puzzle piece and click on "Form Notifications"
    a. Click on "Configure Notifications"
    b. Click on "Notify me" and change the "10" to "1" to receive notifications every time a form is submitted.
    c. Click Save and exit the box by clicking the "X"
14. Click the "Responses" button at the top of the page
    a. Click on the green excel button.
        i. This will open a page to the embedded Excel-type spreadsheet where results can be found
    b. Save the project as a new spreadsheet under the name ECO From (Responses), click "Create"
15. At the top of the Excel-type spreadsheet, click on the "Insert" scroll menu
    a. Click on "Chart"
        i. In the "Data-Select ranges" box, add 'Form Responses 1'!B1:E30

1. For more/less graphing the user must select more rows by replacing the "24" with the amount of rows needed

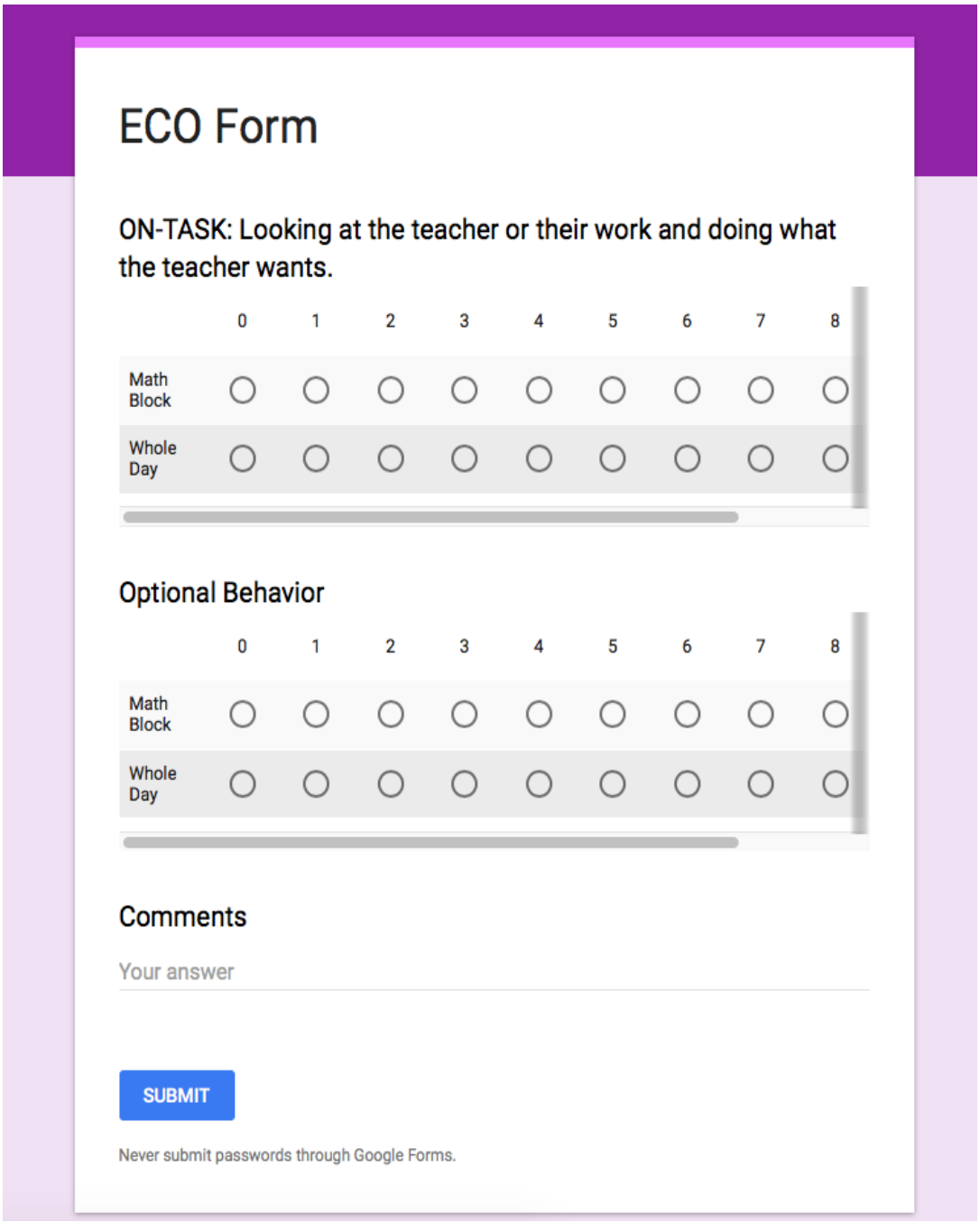
ii. Click the "Use row 1 as headers" box

b. Scroll to the "Charts" section
   i. Click on the "Line Chart" box
c. Click the "Customize" section
   i. Under "Chart Tittle" replace Title with "ECO"
   ii. Under "Horizontal Axis" replace Title with "Sessions"
   iii. Click "Horizontal Axis" and select "Vertical Axis." Replace Title "Rating"
   iv. Set "Min" at 0, set "Max" at 10
d. Click Insert

16. On the top right scroll menu of the chart, click on "Move to own sheet…"
    a. This will move the chart to its own sheet at the bottom of the Excel-type Spreadsheet
17. Double click the "Form Responses 1"
    a. Replace the name with "Responses"
18. Double click the "Chart 1"
    a. Replace the name with "Response Graph"
19. Your form and Spreadsheet are ready!
20. Go back to your ECO Form.
    a. At the top right corner there is the "Send" button. Click here when you are ready to send the form to teachers.
    b. Add the teacher's email and click on the "Include form in email" box
    c. From here you can also copy the link for the form and send it through your own or work email.
    d. Click "Send"

After these steps have been completed, the Google Form application will automatically save the ECO to the user's Google Drive and can be accessed at any time

Note: To save the form to a desktop icon, drag the form's link to the desktop. To save as an icon or bookmark on an iPad follow the steps for saving as a bookmark.



ECO Form

ON-TASK: Looking at the teacher or their work and doing what the teacher wants.

	0	1	2	3	4	5	6	7	8
Math Block	○	○	○	○	○	○	○	○	○
Whole Day	○	○	○	○	○	○	○	○	○

Optional Behavior

	0	1	2	3	4	5	6	7	8
Math Block	○	○	○	○	○	○	○	○	○
Whole Day	○	○	○	○	○	○	○	○	○

Comments

Your answer

SUBMIT

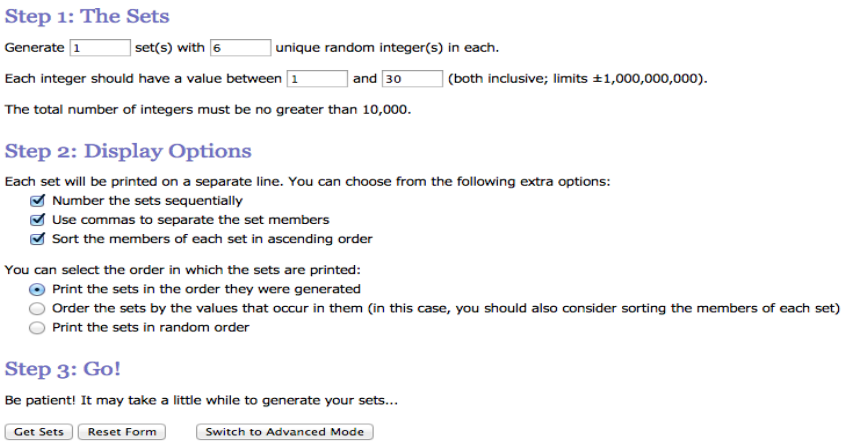
Never submit passwords through Google Forms.

APPENDIX F

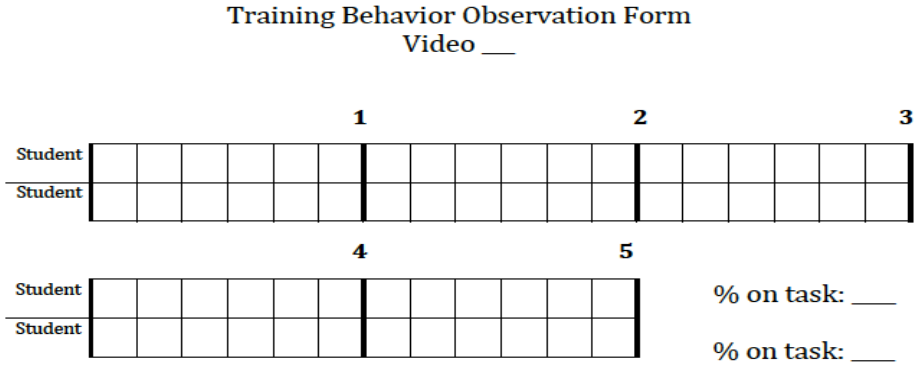
STEPS FOR CREATING THE TRAINING VIDEOS

Steps for creating the on-task training videos

1. Calculate how many off-task intervals you would need to obtain 80, 60, 30 and 70 percent on-task rates. In this case 5 minutes constitute 30, 10-second intervals.
    a. Multiply 30 by .80 and that will give you how many on-task intervals you need. Follow this for all other percentages.
2. Using a random integer set generator found at www.random.org, make a set for each percentage.
    a. For example, for 80% on-task you need 6 off-task intervals.

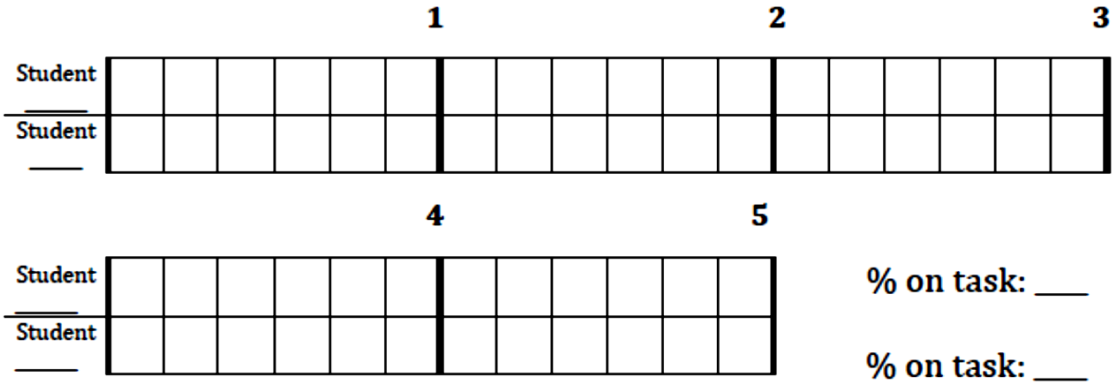


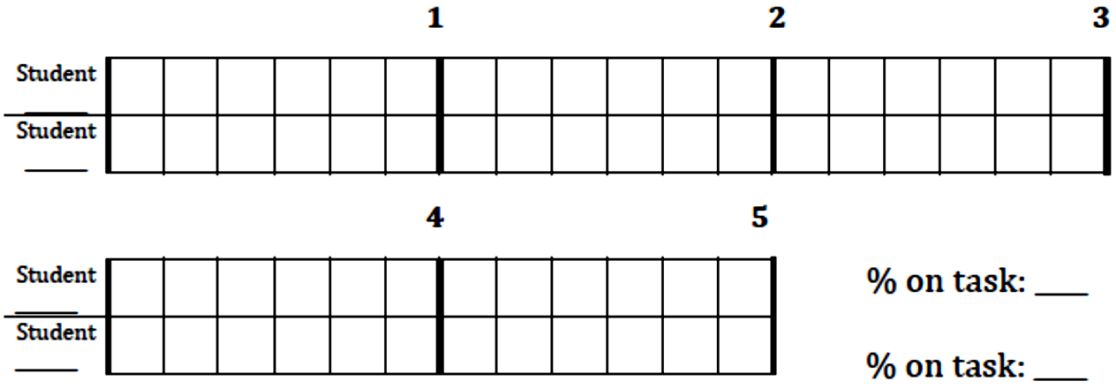
3. Using the numbers you obtained mark the interval corresponding to that number as off-task on the training observation form (provided below).
4. Using the time timer app (or any other that lets you set up several timers) create timers corresponding to each off-task interval.
    a. For example, if your first number was 6, create a timer that rings at 50 seconds.
5. Record the video at least 10 seconds before and after, the 5 minute mark, for editing purposes.
6. These videos were edited using the iMovie app, were the sound was taken out.
7. For Video 3 the same timer set for the 70% on-task was utilize, in this instance the student was asked to behave off-task until the timer beeped.
8. After the videos are created code each video utilizing the same training behavior observation form.
9.



Date:_____ Assistant: _____

Training Behavior Observation Form





Kappa:

Agreement:

Description of each video and students

On the first video the students were asked to complete a math worksheet. On the rest of the videos the students could choose to color from a Mandala coloring book or complete the math worksheet. The students were not required to complete the worksheet accurately just "act" like they were. However, one of the students did complete most of the worksheet.

Student 1: Female student wearing a black blouse and a hair bun.

Student 2: Female student wearing a gray t-shirt and a head bandage.

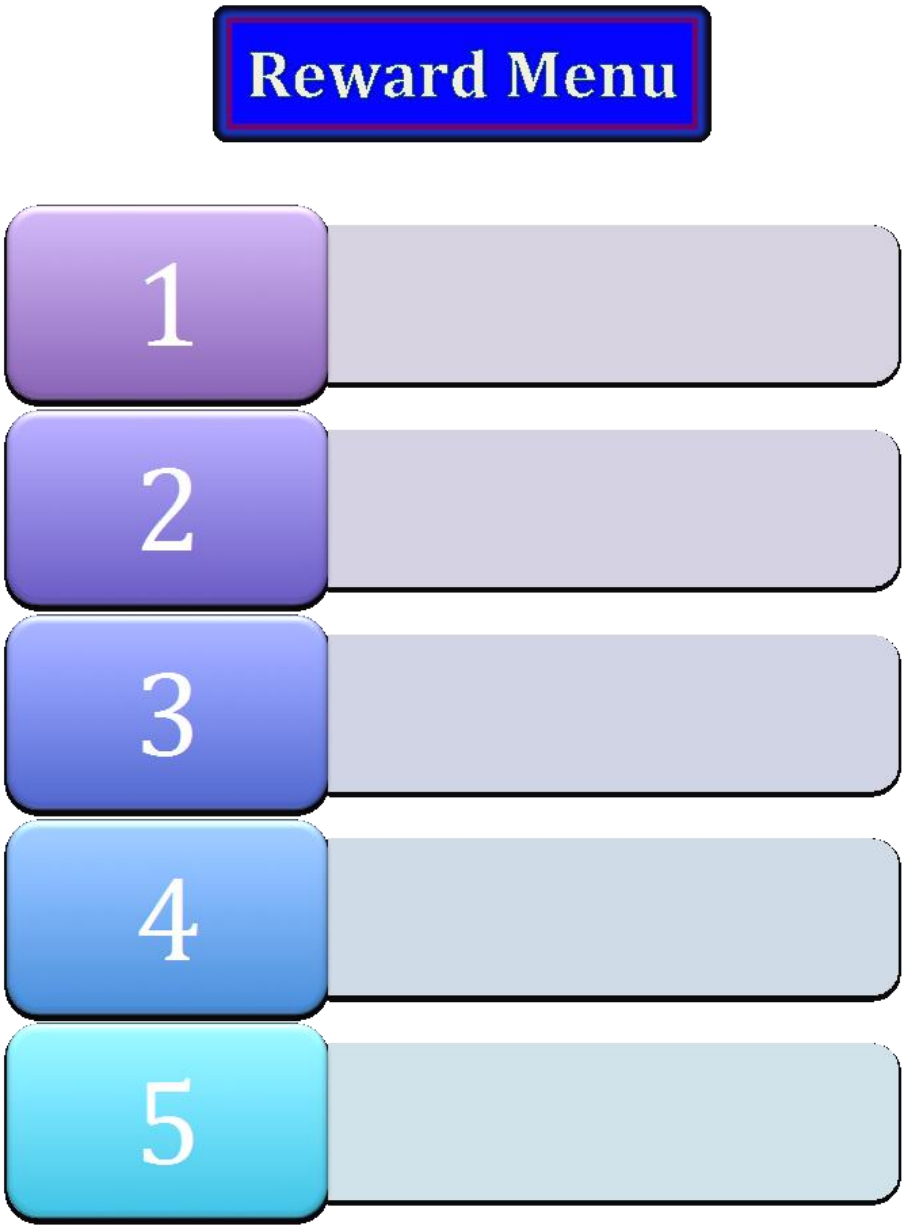
Student 3: Male student wearing a light gray t-shirt and a hand bandage.

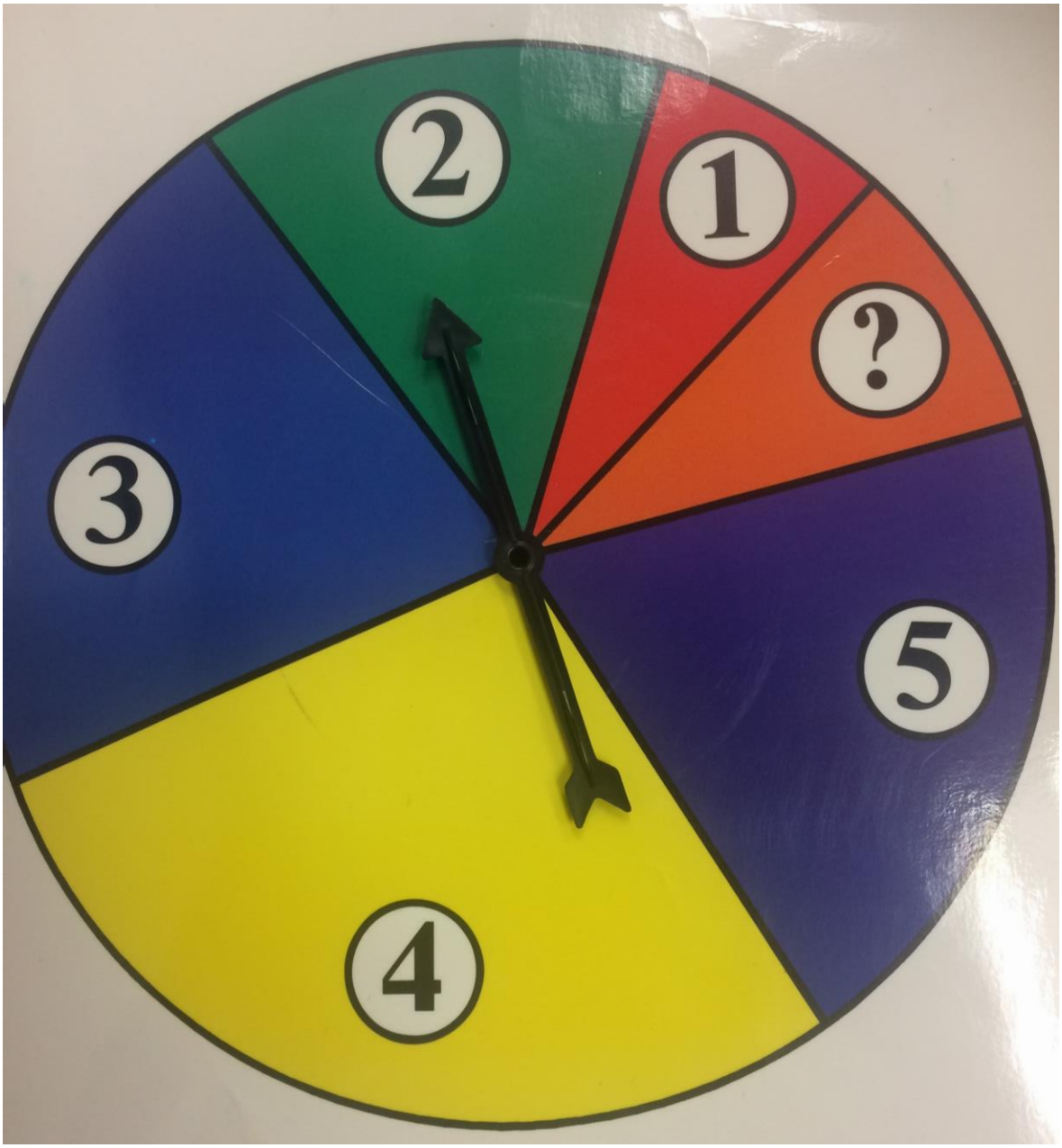
Student 4: Male student wearing a black coat and head and arm bandages.

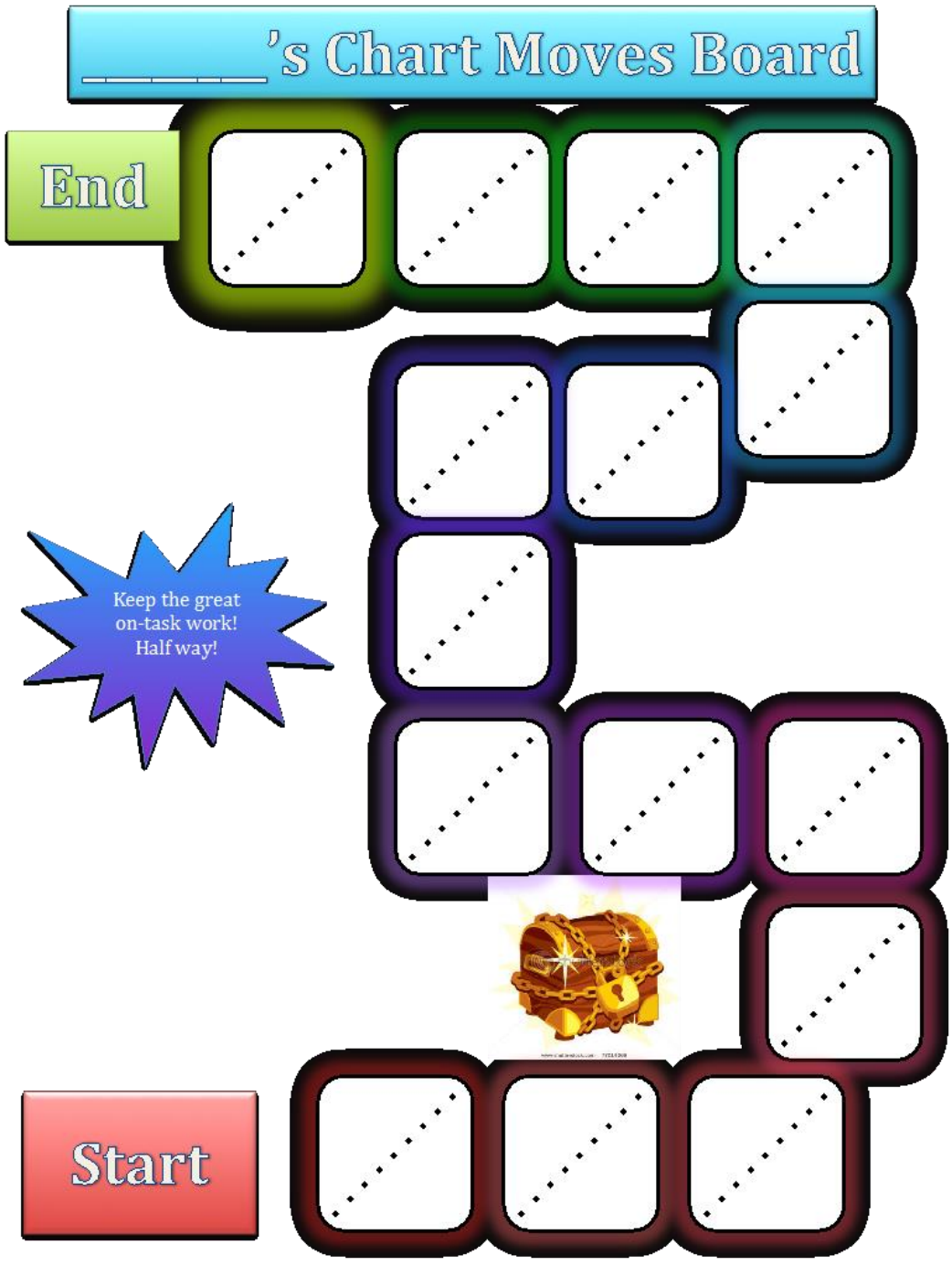
Video Number	On-task rate targeted	On-task rates of each student	Random numbers obtained
1	80%	Student 1: 80% Student 2: 100% Student 3: 93% Student 4: 100%	2, 6, 8, 10, 26, 27
2	60%	Student 1: 60% Student 2: 73% Student 3: 63% Student 4: 90%	4, 5, 7, 12, 15, 19, 20, 21, 23, 25, 27, 30
3	30%	Student 1: 23% Student 2: 67% Student 3: 57% Student 4: 87%	
4	70%	Student 1: 70% Student 2: 90% Student 3: 87% Student 4: 80%	4, 6, 14, 21, 23, 27, 28, 29, 30

APPENDIX G

REWARD MENU, SPINNER, AND CHART MOVES BOARD


Reward Menu
1
2
3
4
5


2
1
?
3
5
4


_____'s Chart Moves Board
End
Keep the great on-task work! Half way!
Start

APPENDIX H

CHECKLISTS

Teacher:
Date:

Orientation Session Checklist
Teacher

1. **On the first day when meeting with a teacher, welcome him/her and tell him/her about the ECO Package intervention**

   - ☐ Indicate it is a program to help students to be on-task in their classroom and work more efficiently
   - ☐ Indicate that the ECO is an online way to record students' on-task behavior
   - ☐ Review the Teacher Consent Form (see Appendix A) for any questions or concerns.
   - ☐ The Teacher Consent Form asks permission to participate in the study and provides information about the study.
   - ☐ Inform the teacher that the participant's parents will not be directly involved with the program.
   - ☐ Inform the teacher that the participant will be rewarded randomly by the researcher for reaching their on-task goal, and for coming to the office reinforcement sessions.
   - ☐ Review the definition of on-task, ask the teacher to repeat it and write it
     - _____
     - _____

2. **Teach the teacher how to correctly use the Electronic Check-Out Form**

   - ☐ Have the teacher choose one optional behavior to be monitored through the ECO
   - ☐ Optional behavior #1:

     _____
   - ☐ Show the teacher what the ECO will look like for their participant
   - ☐ Show the teacher how to rate behaviors on the ECO
   - ☐ Indicate to the teacher that the Comments section is for general comments
   - ☐ Show the teacher how to send the ECO indicating that the data will be uploaded to an Excel-type spreadsheet for the researcher
   - ☐ Orient the teacher to what the confirmation page looks like
   - ☐ Have the teacher access the web address where their participant's ECO will be located
   - ☐ Have the teacher save the webpage to their laptop or iPad

3. **Have the teacher practice using the ECO**
   - ☐ Have the teacher model how to access the ECO webpage

- ☐ Have the teacher create mock ratings based on the "On-Task," and their one optional behavior for the math block and for the whole day
- ☐ Have the teacher make mock comments in the Comments section of the ECO
- ☐ Have the teacher submit the ECO
- ☐ Have the teacher view the mock ECO ratings that would be seen by the students
- ☐ Indicate that a "Surprise Email" will be automatically generated via a "out of office responder" by the researcher on random days
- ☐ Show the teacher what a "Surprise Email" will look like after the teacher submits their response email to the researcher

4. Plan for the creation of the curriculum-based math worksheets

- ☐ Review the AIMSweb MCOMP data with the teacher
- ☐ Ask what math facts the participant is working on in class
- ☐ Reach an agreement on specific math facts to be used when generating the curriculum-based math worksheets.
  - Math Facts: _____
- ☐ Indicate that the participant is to work on these worksheets during independent seatwork time
- ☐ Indicate that the participant should only be allowed 15 minutes to complete as much of the worksheet as they can
- ☐ Indicate that after the 15 minutes, the teacher should collect the worksheet and the researcher will collect it from them
- ☐ Inform the teachers they should complete their ECO ratings after they have collected the participant's worksheet.
- ☐ They can rate the other whole day behaviors at the end of the day.

5. Review the BASC-3-TF

- ☐ Review the BASC-3-TF and how to complete this questionnaire
- ☐ Choose time options for check-out: _____

6. **Perform the teacher calibration session**

- ☐ Have the teacher watch the three 5-minute videos
- ☐ Ask the teacher how they would rate the student
  - Video ___: _____ Teacher rating: _____ _____
  - Video ___: _____ Teacher rating: _____ _____
  - Video ___: _____ Teacher rating: _____ _____
- ☐ If the rating is within +/- 1 points from the actual on-task rate: thank the teacher and end the session.

- ☐ If the rating is not within +/- 1 points from the actual on-task rate:
    - Review the video providing feedback on what off-task and on-task behaviors look like
    - Ask the teacher to rate the student one more time.

Teacher:
Date:

Teacher after baseline orientation

1. **Welcome him/her**
    - ☐ Briefly review the baseline data
    - ☐ Establish a percentage goal for the optional behavior
        - Goal: _____
    - ☐ Establish 70% goal for on-task behavior
    - ☐ Ask for any questions and clarify any doubts

Participant:
Parent:
Date:

Study Participation Orientation Session Checklist
Parent

1. **On the first day when meeting with a parent, welcome him/her and tell him/her about the ECO Program**

   - ☐ Explain teacher referral due to on-task rates and math CBM results
   - ☐ Define on-task behaviors
   - ☐ Indicate it is an intervention to help students to be on-task in the classroom.
   - ☐ Indicate that the ECO is an online way to record students' on-task behavior.
   - ☐ Inform the parent that the participant will be monitored on "On-Task" and one optional behavior indicated by the teacher.
   - ☐ Inform the parent that the researcher will randomly reinforce the participant for reaching their goals of on-task behavior, and coming to the office sessions.

2. **Show the parent the ECO form for their participant**

   - ☐ Show the parent what the ECO will look like for their participant
   - ☐ Indicate that ratings are based on ratings given by the teacher
   - ☐ Indicate that the ratings are on a scale of 0 – 10 with anchors of "0%" and 100%" at 0 and 10, respectively.
   - ☐ Indicate that the teacher has the option to type general comments in the Comments section of the ECO
   - ☐ Indicate that a "Surprise Email" will be automatically generated via a "out of office responder" by the researcher on random days
   - ☐ Show the parent what a "Surprise Email" will look like after the teacher submits a response email to the researcher

3. **Review the Parental Permission form**
   - ☐ Review the Parental Permission form
   - ☐ Ask for any questions regarding the study or their role in the study

Participant: Site:
Date:

Orientation Session Checklist
Participant

1. **On the first day when meeting with the participant, welcome him/her and tell him/her about the ECO Package intervention**

   - ☐ Indicate it is an intervention to help students to be on-task in the classroom and to help them complete their classwork.
   - ☐ Indicate that the ECO is an online way for teachers to record his/her on-task behavior.
   - ☐ Indicate that their teachers will rate their behaviors electronically and that they will be able to see their ratings with the researcher at check-out.
   - ☐ Inform the participant that he/she will be monitored on "On-Task" and one optional behavior chosen by their teacher.
   - ☐ Inform the participant that by coming to the office during reinforcement sessions they will get to work towards a prize for meeting their on-task goals.
   - ☐ Inform the participant that their teacher will also receive a "Surprise Email" that will be sent at random indicating that the participant can come for an office reinforcement session, and receive a prize if they met their on-task goal.

2. **Have the participant model the behaviors on their ECO forms**
   - ☐ Show the participant the "What is On-task Behavior" fast hand animation video.
   - ☐ Have the participant define what "On-Task" behavior looks like: "*looking at the teacher or their work and doing what the teacher wants"*
   - ☐ Have the participant define and show what the one optional behavior looks like

     If the participant does model any or all of the behaviors, researcher should exhibit the behavior and have the participant model the behavior back to the researcher

3. **Show the participant what the ECO will look like**
   - ☐ Show the participant the ECO
   - ☐ Indicate that ratings are based on ratings given by the teacher
   - ☐ Indicate that the ratings are on a scale of 0 -10 with anchors of "0%" and "100%" at 0 and 10, respectively
   - ☐ Indicate that the teacher can also type comments about the participant on the ECO

4. **Show the participant what ECO ratings will look like**

- ☐ Submit a mock ECO to the researcher's email address
- ☐ Open and view the ECO rating email
- ☐ Show the participant the email and inform the participant of the mock ratings for each behavior and any comments made on the mock ECO
- ☐ Have the participant indicate the ratings of each behavior and any comments made on the mock Electronic CICO
- ☐ Ask for any questions about how to read the email

5. **Inform the participant of how to obtain a reinforcement for coming to the afternoon sessions**

- ☐ Inform the participant that they will be randomly rewarded for meeting their on-task goals.
- ☐ Inform the participant that after the teacher submits the ECO, a "Surprise Email" will appear letting them know that a reinforcement session has been earned.
- ☐ Inform the participant that if their teacher says there is a Prize Day available, they should go to the researcher's office that afternoon.
- ☐ Tell the participant that they will be able to win prizes and rewards with the Reward Spinner, and with a Mystery Motivator (show them the Reward Spinner and Mystery Motivator and demonstrate how it works).
- ☐ Inform the participant that during reinforcement sessions they will earn a chance to color in one side of a square on their Chart Moves Board if they come to their afternoon session, and get a chance to color in the left side of the square if they met their on-task goal. (Show chart and explain how it works).
- ☐ Have the participant choose 5 reinforcers to be used with their Rewards Menu from the psychologist's office prizes or they can provide small rewards to be earned.
- ☐ Have the participant choose one big reinforcer for their Chart Moves Board. These could be
- ☐ Have the participant spin the Spinner Wheel to obtain a prize from their Rewards Menu.
- ☐ Tell the participant that they will review their ratings every afternoon at _____ (time).

4. **Review the Participant Assent letter**

- ☐ Review the Participant Assent letter

☐ Ask for any questions regarding the study or their role in the study

Participant: Duration:

Date:

Participant Office Reinforcement Session Checklist

1. **When the participant first comes to the office reinforcement session**

   ☐ Greet the participant and thank them from coming
   ☐ Tell them that it is a prize day.
   ☐ Have the student color in the right side of the square half for coming to the session.

2. **Review the participant's ratings data since the last office reinforcement session**

   ☐ From the Excel-type spreadsheet, find the participant's data since the last office reinforcement session
   ☐ Have the student interpret the graph and ask them if they met their on-task goal. ____ Met Goal _____ didn't meet goal
   ☐ If goal was met, have them color in the left side of the square half.
   ☐ Review any comments made by the teacher
   ☐ Ask the participant if they have any questions about their ratings

3. **Have the participant model their target behavior**

   ☐ Have the participant define what "On-Task" behavior looks like "*looking at the teacher or their work and doing what the teacher wants"*
   ☐ Have the participant to define the optional behaviors:
   ***If the participant cannot define any or all of the behaviors, the researcher should define and exhibit the behavior and have the participant model the behavior back to the researcher.*
   **If the participant correctly defines the behavior with 100% accuracy across two consecutive office reinforcement sessions, this step can be skipped.*
   ☐ Was the participant able to define all of the behaviors? _____Yes _____ No

4. **Participant Marking the Fun 'O' Meter**

   ☐ After the participant colors the left side of the chart moves square, have them mark the Fun 'O' Meter.
   ☐ Ask if the participant liked the session and thought it was useful

- ☐ If the participant marks the Fun 'O' Meter in the "Ouch!" or "No Help" regions, ask them what is wrong and how you could make it better
- ☐ Try to adjust the sessions to the participant's needs to make it fun and helpful
- ☐ Before letting them go, remind them that they are also working for the big prize and encourage them to do their best the next day.
- ☐ Let them know that you look forward to seeing them tomorrow afternoon.

Participant: Duration:
Date:

Participant Office Check-out Session Checklist

1. **When the participant first comes to the office reinforcement session**

   - ☐ Greet the participant and thank them from coming

2. **Verbally ask how the day went**

   - ☐ Ask the participant how they think their day went
   - ☐ Quickly review the ratings on the spreadsheet
   - ☐ Ask the student to interpret the graph and ask them if they met their goals
   - ☐ Review any comments made by the teacher
   - ☐ Ask the participant if they have any questions about their ratings
   - ☐ Let the participants know you look forward to seeing the next afternoon, and that they may get a prize day.

Teacher:
Date:

Teacher Follow-Up Session Checklist

- ☐ During independent seatwork time, give the participant a math worksheet that is provided by the researcher
- ☐ Monitor the participants behavior for the 15 minutes allowed for the worksheet
- ☐ Collect the math worksheet after the 15 minutes is completed
- ☐ Indicate the math worksheet will be collected by the researcher daily
- ☐ Have the teacher complete an ECO form for each day
- ☐ Have the teacher complete the BASC-3-TR.

APPENDIX I

RECRUITMENT LETTER AND CONSENT

AND ASSENT FORMS

_____ ___, 2016

Student: _____

Re: Electronic Check-out intervention by Virginia Ramos Matias

Dear Mr. & Mrs. _____:

I am writing to let you know about an opportunity to participate in a research study to increase on-task behaviors. This study is being conducted by Virginia M. Ramos Matias, the current school psychologist at your student's elementary, in partial completion of her doctoral dissertation at the University of Utah. The purpose of this study is to increase the on-task behavior of children who display high rates of off-task behavior in the classroom.

You are receiving this letter because your student's teacher referred him/her for possible study participation due to his/her difficulties with on-task behaviors in the classroom. I would like to follow up with a phone call within the next 4 days.

If you do not wish to be contacted further for the purposes of this study or would like more information please mark below and return this letter with your student or you can contact me via email at virginia.ramosmatias@canyonsdistrict.org or to my office at (801) 826-9405. *Agreement to be contacted or a request for more information does not obligate you to participate in any study.*

It is up to you to decide whether to allow your child to take part in this study. Refusal to allow your child to participate or the decision to withdraw your child from this research will involve no penalty or loss of benefits to which your child is otherwise entitled nor will it affect your or your child's relationship with the investigator. There are no costs or compensation for study participation.

Thank you again for considering this research opportunity.

Sincerely,

Virginia M. Ramos Matias, M. Ed., NCSP
Canyons School District School Psychologist
University of Utah Doctoral Candidate

☐ I **do not** wish to be further contacted for the purposes of this study.
_____ (Initial)

Parent Consent for Study Participation and Observations

BACKGROUND

The purpose of this study is to increase your child's on-task behavior in the classroom. This study will involve having your child's behaviors recorded through the use of an electronic Check-out (ECO) from. An ECO form is a communication system designed to allow the school to rate a student on their classroom behavior, and increase a student's appropriate behavior by providing reinforcement for the desired behavior. Throughout the study, we will be calling this system the "ECO." Your child's regular education math teacher will give ratings on the ECO form for independent seatwork time during his or her math block and one rating for the whole day. The researcher will also review these ratings daily with your child. One goal of this study is to increase your child's ability to remain on-task in the classroom by having them model appropriate on-task behavior to the researcher and review the ratings with the researcher. By increasing the time that your child remains focused on his or her work, it may enhance your child's academic performance. There will be an additional behavior chosen by the teacher and reinforced through the use of the ECO intervention. This behavior will be reviewed with you during the orientation session.

STUDY PROCEDURES

This consent is to obtain permission to observe your child for study qualification purposes and if inclusion criteria are met for study participation. I would like permission for a trained graduate observer or the primary researcher to observe your child in his or her classroom. Observation forms of children who do not participate in the study will be destroyed.

To qualify for the study your student needs to be 60% or less on-task during the math period observed for the first observation, and be 60% or less on-task on average for the 5 baseline observations. Participating in the study would include the following: 1) continued classroom observations, 2) taking your child to the school psychologist's office to review their teacher's ratings of their behavior, 3) your child completing individualized math worksheets based on their abilities and their teacher's recommendations, 4) your child receiving coaching, encouragement, and reinforcement from the researcher, 5) making copies of your child's math worksheets, 6) the researcher periodically consulting with the teacher concerning your child's classroom behavior, 7) your child filling out a brief questionnaire about being in the study, and 8) having the classroom teacher fill out a brief questionnaire about the study. You may preview these questionnaires if you wish.

Meeting with your child to review their ratings with the researcher during office sessions will involve your child coming to an office for about 5 minutes daily for approximately 5 weeks. These sessions will include reviewing your child's behavioral ratings, coaching behavioral expectations, tracking your child's behavior on their individual graph, and receiving reinforcement for achieving behavioral goals. These times will take place after school is out or during a time in which the teacher agrees is appropriate. During these weeks, your child will be monitored with ECO forms. At the end of the 5 weeks, your

child and their teacher will be asked to fill out a brief questionnaire about the study. This should only take about 10 minutes. Your child will be observed in the classroom multiple times before and during the weeks that his or her behaviors are being monitored through the ECO forms. Follow-up observations of your child will be conducted approximately 2 weeks after your child's last ECO observation.

RISKS
Participation in this study is completely optional, and at your own discretion. If you think you would like your child to participate, I would appreciate it if you would discuss it with him/her and include him/her in making this decision. The major disadvantage is your child feeling singled out as being inattentive or disruptive. Your child may also feel uncomfortable about meeting during school time or right before school is over but collaboration between the researcher and your child's teacher will be made to ensure that no instructional time will be lost due to these meetings.

BENEFITS
Possible benefits from participating in the study include focusing more on school work, which could in turn help them feel better about themselves and school, as well as the possibility of increasing his or her academic performance.

CONFIDENTIALITY
Observation forms will only contain the child's first name, written in pencil. After the study is completed, data will be analyzed and your child will be assigned a number name such as "Participant 1" or "Participant 3", etc. Names on the original observation recording forms and the math worksheets collected during the study will be changed to their assigned number name, and your child will only be referred to by their assigned number name when reporting the results of this study. Through teacher observations on the ECO forms, names will be changed to their assigned number name following the conclusion of the study. Except for the original consent forms; no documents will be kept that contain your child's name. The researcher will keep the consent forms secure in a locked file in her office.

PERSON TO CONTACT
If you have questions, complaints, or concerns about this study, you can contact Virginia M. Ramos Matias at (801) 826-9405 or (787) 601-7860 and virginia.ramos.matias@gmail.com. If you feel you have been harmed as a result of participation, please call my faculty advisor Dr. William R. Jenson at (801) 581-7148. If Dr. Jenson is unavailable please leave a message and your call will be returned as soon as possible.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns that you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
It is up to you to decide whether to allow your child to take part in this study. Refusal to allow your child to participate or the decision to withdraw your child from this research will involve no penalty or loss of benefits to which your child is otherwise entitled nor will it affect you or your child's relationship with the investigator.

Withdrawal: After giving initial consent, consent can be withdrawn at any time by sending a written note to your child's teacher asking that no further observations be done on your child and/or calling me at (801) 826-9405 or (787) 601-7860. If you withdraw consent, any observation forms that have already been filled out on your child will be destroyed immediately.

COSTS AND COMPENSATION TO PARTICIPANTS
There are no costs or compensation for study participation. The anticipated conclusion of this study is Spring 2016. After the study is completed, I would be happy to share the results with you, as well as any possible recommendations for your child.

CONSENT
By signing this consent form, I confirm that I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

_____
Child's Name

_____
Parent/Guardian's Name

_____ _____
Parent/Guardian's Signature Date

_____
Relationship to Child

_____
Name of Researcher or Staff

_____ _____
Signature of Researcher or Staff Date

Assent to Participate in the Study

Who are we and what are we doing?
We are from the University of Utah. We would like to ask if you would be in a research study. A research study is a way to find out new information about something.

Why are we asking you to be in this research study?
We would like to ask you to be in a research study because we are trying to learn more about how to help students to stay focused on their work and to do better on their assignments.

What happened in the research study?
If you are willing to be in this study and your parents agree, this is what will happen. You will meet with the school psychologist once daily for about five minutes right before or right after end of school day. When you are out of class you will review the ratings given by your teacher of how your behaviors are in the classroom. During the study, your teacher will be using an Electronic Check-out form, called the ECO form that will help track your on-task behaviors while you are working on your assignments, and during class. At times, there will be researchers in your classroom observing the class. At the end of this study, we will ask you questions about how you liked being in this program. These activities will last about 5 weeks.

Will any part of the research study hurt you?
It is possible that being part of this study may make you feel like you are different because it is difficult for you to stay focused on your assignments. You may also feel uncomfortable being removed from your classroom.

Will the research study help you or anyone else?
Being in this study will help us to understand if the different activities that we do in this study will help students to stay focused on their assignments. Being in this study may also help you to keep focused on the work your teacher gives you, finish more of your work, and help you to feel better about your ability to do well at school.

Who will see the information about you?
All of the information from this study will be kept locked up in my office so that only the people helping me with this project will see them. Your name will not be used on any papers that people other than those helping me on this project will see.

What if you have any questions about the research study?
You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can call me, Virginia M. Ramos (801) 826-9405 or ask me next time we meet.

Do you have to be in the research study?
If you don't want to be in this study, you don't have to be in it. Remember, being in this study is up to you and no one will be upset if you don't want to be in it. You can change

your mind later if you want to stop. Please talk about this with your parents before you decide if you would like to do it. We will also ask your parents to give their permission for you to be in this study. Even if your parents say "yes" you can still decide not to do this.

Consent

I was able to ask questions about this study. Signing my name at the bottom means that I agree to be in this study. My parents and I will be given a copy of this form after I have signed it.

_____
Printed Name

_____ _____
Sign your name on this line Date

_____
Printed Name of Person Obtaining Assent

_____ _____
Signature of Person Obtaining Assent Date

The following should be completed by the study member conducting the assent process if the participant agrees to be in the study. Initial the appropriate selection:

_____ The participant is capable of reading the assent form and has signed above as documentation of assent to take part in this study.

_____ The participant is not capable of reading the assent form, but the information was verbally explained to him/her. The participant signed above as documentation of assent to take part in this study.

Teacher Consent Form

BACKGROUND

The purpose of this study is to increase students' on-task and one optional behavior in the classroom. This study will involve having each participant's behaviors rated through the use of an electronic version of a check out school note (i.e. ECO form). An ECO form is a communication system designed to allow teachers to rate a student on their classroom behavior and share this information with the psychologist to reinforce and increase their appropriate behaviors at school. Throughout the study, we will be calling this the "ECO form." As part of the study, each participant will review your ratings from the ECO with the researcher. The ECO forms will be used while the participants are working on independent seatwork in math, and the other rating will be for the whole day. One goal of this study is to increase each participant's ability to remain on-task in the classroom by having him or her model appropriate on-task behavior and review their teacher's ratings of their own classroom behavior with multiple people. By increasing the time each participant remains focused on his or her work, it may enhance the participant's academic performance. There will be an additional behavior chosen by you and reinforced through the use of the ECO intervention.

STUDY PROCEDURE

Your participation in this study would include the following: 1) rating your participant's in class behaviors through the use of the Electronic Check-out forms during independent seatwork time in math, 2) your participant completing individualized curriculum based math worksheets during independent seatwork time, 3) scheduled observations conducted in your classroom during independent seatwork time in math, 4) your participant leaving the classroom occasionally in order to participate in office sessions if the participant is unable to meet after school is out, 5) three brief meetings with the researcher concerning the intervention program, and 6) completion of a behavioral questionnaire concerning the participant and a brief questionnaire concerning the intervention.

Throughout the study, you will begin to provide your participant with individualized curriculum based math worksheets to be completed during independent math seatwork time. During the first week the researcher will monitor your participant for on-task behaviors. Office sessions will not occur at this time and this information will not be shared with the participant or their parents. After this first week and if the participant qualifies for the study, you will begin to monitor the participant with the ECO forms. Meetings with your participant to review their ratings with the researcher during office sessions will begin at this time. These will involve your participant coming to an office for about 5 minutes daily for approximately 5 weeks. These sessions will include reviewing your participant's behavioral ratings as rated by you, coaching behavioral expectations, and receiving reinforcement for reviewing their behavioral ratings. These times will take place 15 minutes before to 5 minutes after end of school day or during a time in which you agree is appropriate. At the end of the five weeks, your participant, and yourself will be asked to fill out a brief questionnaire about the study. This should only take about 10 minutes. Your participant will be observed in the classroom multiple times before and during the weeks that his or her behaviors are being monitored through the

ECO intervention. Follow-up observations of your participant will be conducted approximately 2 weeks after your participant's last ECO observation. The participant will once again complete the curriculum based math worksheets while being observed by the researcher.

RISKS
Participation in this study is completely optional, and at your own discretion. Participation in the study may result in loss of time due to completion of the ECO forms, the three brief meetings with the researcher, and completion of the questionnaires. It also includes the minutes to give and collect the math worksheets, and being consistent with the time in which the student completes his independent seatwork time.

BENEFITS
Possible benefits from participating in the study include increases in your participant's ability to focus on schoolwork, which could in turn help them to feel better about themselves and school. Increased time spent focused on schoolwork could also lead to increases in academic performance.

CONFIDENTIALITY
After the study is completed, data will be analyzed and each participant and teacher will be assigned a corresponding number name such as "Participant 1" and "Teacher 1", etc. Names on the original observation recording forms, math worksheets, and questionnaires collected during the study will be changed to their assigned number name, and the participants and teachers will only be referred to by their assigned number name when reporting the results of this study. Except for the original consent forms; no documents will be kept that contain your name. The researcher will keep the consent forms secure in a locked file in his office.

PERSON TO CONTACT
If you have questions, complaints, or concerns about this study, you can contact Virginia M. Ramos Matias at (787) 601-7860 or virginia.ramos.matias@gmail.com. If you feel you have been harmed as a result of participation, please call my faculty advisor Dr. William R. Jenson at (801) 581-7148. If Dr. Jenson is unavailable please leave a message and your call will be returned as soon as possible.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns that you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
It is up to you to decide whether to take part in this study. Refusal to participate or the decision to withdraw from this research will involve no penalty or loss of benefits to which you are otherwise entitled. This will not affect your relationship with the investigator. There are no costs or compensation for study participation.

COSTS AND COMPENSATION TO PARTICIPANTS
There are no costs or compensation for study participation. The anticipated conclusion of this study is Spring 2016. After the study is completed, I would be happy to share the results with you, as well as any possible recommendations for your participant.

CONSENT
By signing this consent form, I confirm that I have read the information in this consent form and have had the opportunity to ask questions. I will be given a signed copy of this consent form. I voluntarily agree to take part in this study.

_____
Printed Name of Teacher Participant

_____ _____
Signature of Teacher Participant Date

_____
Printed Name of Person Obtaining Consent

_____ _____
Signature of Person Obtaining Consent Date

REFERENCES

Allen, L. J. (1993). Use of contingency contracting to increase on-task beahvior with primary students. *Psychology Reports, 72*, 905–906.

Aloe, A. M., Amo, L. C., & Shanahan, M. E. (2014). Classroom management self-efficacy and burnout: A multivariate meta-analysis. *Educational Psychology Review, 26*, 101–126. doi:10.1007/s10648-013-9244-0

Altman, D. G. (1991). *Practical statistics for medical research*. London, United Kingdom: Chapman & Hall/CRC.

Archer, K., Savage, R., Sanghera-Sidhu, S., Wood, E., Gottardo, A., & Chen, V. (2014). Examining the effectiveness of technology use in classrooms: A tertiary meta-analysis. *Computers & Education, 78*, 140–149. doi:10.1016/j.compedu.2014.06.001

Barber, A. L. (2013). *An evaluation of check-in/check-out with accountability tracking for at-risk students in a high-need elementary school.* (Master's Thesis). Retrieved from ProQuest Dissertations and Theses. (1543038)

Battaglia, A. A., Radley, K. C., & Ness, E. J. (2015). Evaluating the effects of On-Task In a Box as a class-wide intervention. *Psychology in the Schools, 52*(8), 743–755. doi:10.1002/pits.21858

Beaty-O'Ferrall, M. E., Green, A., & Hanna, F. (2010). Classroom management strategies for difficult students: Promoting change through relationships. *Middle School Journal, 41*(4), 4–11.

Benedict, E. A., Horner, R. H., & Squires, J. K. (2007). Assessment and implementation of positive behavior support in preschools. *Topics on Early Childhood Special Education, 27*(3), 174–192.

Blood, E. (2011). Point systems made simple with Google Docs. *Interventions in School and Clinic, 46*(5). 305–309. doi:10.1177/1053451210395386

Bowen, J., Jenson, W. R., & Clark, E. (2004). *School-based interventions for students with behavior problems*. New York: Springer.

Bowman-Perrot, L., Burke, M. D., de Marin, S., Zhang, N., & Davis, H. (2015). A meta-analysis of single case research on behavior contracts: Effects on behavioral and

academic outcomes among children and youth. *Behavior Modification, 39*(2), 247–269.

Briesch, A. M., Chafouleas, S. M., & Riley-Tillman, T. C. (2010). Generalizability and dependability of behavior assessment methods to estimate academic engagement: A comparison of systematic direct observation and direct behavior rating. *School Psychology Review, 39*(3), 408–421.

Bruhn, A. L., Lane, K. L., & Hirsch, S. E. (2014). A review of Tier 2 interventions conducted within multitiered models of behavioral prevention. *Journal of Emotional and Behavioral Disorders, 22*(3), 171–189. doi:10.1177/1063426613476092

Burke, M. D., & Vannest, K. J. (2008). Behavioral-progress monitoring using the electronic daily behavioral report card (e-DBRC) system. *Preventing School Failure, 52*(3), 51-59.

Campbell, A., & Anderson, C. M. (2011). Check-in/check-out: A systematic evaluation and component analysis. *Journal of Applied Behavior Analysis, 44*(2), 315–326. doi:10.1901/jaba.2011.44-315

Chafouleas, S. M., McDougal, J. L., Riley-Tillman, T. C., Panahon, C. J., & Hilt, A. M. (2005). What do daily behavior report cards (DBRCs) measure? An initial comparison of DBRCs with direct observation for off-task behavior. *Psychology in the Schools, 42*(6), 669–676.

Chafouleas, S. M., Riley-Tillman, T. C., Sassu, K. A., LaFrance, M. J., & Patwa, S. S. (2007). Daily behavior report cards: An investigation of the consistency of on-task data across raters and methods. *Journal of Positive Behavior Interventions, 9*(1), 30–37.

Cheney, D. A., Stage, S. A., Hawken, L. S., Lynass, L., Mielenz, C., & Waugh, M. (2009). A 2-year outcome study of the Check, Connect, and Expect intervention for students at risk for severe behavior problems. *Journal of Emotional and Behavioral Disorders, 17*(4), 226–243. doi:10.1177/1063426609339186

Collins, A., & Halverson, R. (2010). The second educational revolution: Rethinking education in the age of technology. *Journal of Computer Assisted Learning, 26*, 18–27. doi:10.111/j.1365-2729.2009.00339.x

Crone, D. A., Hawken, L. S., & Horner, R. H. (2010). *Responding to problem behavior in schools: The Behavior Education Program* (2nd ed.). New York: Guilford Press.

Crone, D. A., Horner, R. H., & Hawken, L. S. (2004). *Responding to problem behavior in schools: The Behavior Education Program.* New York: Guilford Press.

Cuvo, J. C. (1979). Multiple-baseline design in instructional research: Pitfalls of measurement and procedural advantages. *American Journal of Mental Deficiency,*

84(3), 219–228.

Dart, E. H., Furlow, C. M., Collins, T. A., Brewer, E., Gresham, F. M., & Chenier, K. H. (2014). Peer-mediated check-in/check-out for students at risk for internalizing disorders. *School Psychology Quarterly, 30*(2), 229–243. doi:10.1037/spq1111192

Ducharme, J. M., Folino, A., & DeRosie, J. (2008). Errorless acquiescence training: A potential "keystone" approach to building peer interaction skills in children with severe problem behavior. *Behavior Modification, 32*, 39-60.

Ducharme, J. M., & Shecter, C. (2011). Bridging the gap between clinical and classroom intervention: Keystone approaches for students with challenging behavior. *School Psychology Review, 40*(2), 257–274.

Duda, M. A., Dunlap, G., Fox, L., Lentini, R., & Clarke, S. (2004). An experimental evaluation of positive behavior support in a community preschool program. *Topics in Early Childhood Special Education, 24*(3), 143–155.

Elliot, S. N. (1988). Acceptability of behavioral treatments: Review of variables that influence treatment selection. *Professional Psychology: Research into Practice, 19*, 68-80.

Elliot, S. N. (1986). Children's ratings of the acceptability of classroom interventions for misbehavior: Findings and methodological considerations. *Journal of School Psychology, 24*, 23–35.

Elliot, S. N., & Treuting, M. V. (1991). The behavior intervention rating scale: Development and validation of a pretreatment acceptability and effectiveness measure. *Journal of School Psychology, 29*, 43–51.

Evelo, D., Sinclair, M., Hurley, C., Christenson, S., & Thurlow, M. (1996). *Keeping kids in school: Using check & connect for dropout prevention.* Minneapolis, MN: Institute on Community Integration (UAP), College of Education and Human Development, University of Minnesota.

Fabiano, G. A., Vujnovic, R., Naylor, J., Pariseau, M., & Robins, M. (2009). An investigation of the technical adequacy of a Daily Behavior Report Card (DBRC) for monitoring progress of students with attention-deficit/hyperactivity disorder in special education placements. *Assessment for Effective Intervention, 34*(4), 231–241. doi:10.1177/1534508409333344

Fabiano, G. A., Vujnovic, R. K., Pelham, W. E., Waschbush, D. A., Massetti, G. M., Pariseau, M. E., . . . Volker, M. (2010). Enhancing the effectiveness of special education programming for children with attention deficit hyperactivity disorder using a daily report card. *School Psychology Review, 39*(2), 219–239.

Ferster, C. B., & Skinner, B. F. (1957). *Schedules of reinforcement*. New York:

Appleton-Century-Crofts.

Filter, K. J., McKenna, M. K., Benedict, E. A., Horner, R. H., Todd, A., & Watson, J. (2007). Check in/check out: A post hoc evaluation of an efficient, secondary level targeted intervention for reducing problem behaviors in schools. *Education and Treatment of Children, 30*(1), 69–84. doi:10.1353/etc/2007.0000

Gilberston, D., Witt, J. C., Duhon, G., & Dufrene, B. (2008). Using brief assessments to select math fluency and on-task behavior interventions: An investigation of treatment utility. *Education and Treatment of Children, 31*(2), 167–181. doi:10.1353/etc.0.0023

Goodwin, B. (2012). Research says: New teachers face three common challenges. *Supporting Beginning Teachers, 69*(8), 85–85. Retrieved from www.ascd.org/publications/educational-leadership

Gray, L., Taie, S., & O'Rear, I., & U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences. (2015, April). *Public school teacher attrition and mobility in the first five years: Results from the first through fifth waves of the 2007–08 Beginning Teacher Logitudinal Study.* Retrieved from http://nces.ed.gov/pubs2015/2015337.pdf

Greenwood, C. R., Horton, B. T., & Utley, C. A. (2002). Academic engagement: Current perspectives on research and practice. *School Psychology Review, 31*(3), 328–349.

Gresham, F. M. (2004). Current status and future directions of school based behavioral interventions. *School Psychology Review, 33*(3), 326–343.

Hagan-Burke, S., Burke, M. D., Martin, E., Boon, R. T., Fore, C. III., & Kirkendoll, D. (2005). The internal consistency of the School Wide Subscales of the Effective Behavioral Support Survey. *Educations and Treatment of Children, 28*(4), 400–413.

Hawken, L. (2006). School psychologists as leaders in the implementation of a targeted intervention: The Behavior Education Program. *School Psychology Quarterly, 21*(1), 91–111.

Hawken, L., & Horner, R. H. (2003). Evaluation of a targeted intervention within a schoolwide system of behavior support. *Journal of Behavioral Education, 12*(3), 225–240.

Hawken, L., Adolphson, S., MacLeod, K., & Schumann, J. (2009). Secondary tier interventions and supports. In G. Sugai, R. H. Horner, G. Dunlap, & W. Sailor (Eds.), *Handbook of positive behavior support* (pp. 395-420). New York: Springer.

Hawken, L. S., Bundock, K., Barrett, C. A., Eber, L., Breen, K., & Phillips, D. (2015).

Large scale implementation of check-in, check-out: A descriptive study. *Canadian Journal of School Psychology, 30*(4), 304–319. doi:10.1177/0829573515600100

Hawken, L. S., Bundock, K., Kladis, K., O'Keeffe, B., & Barrett, C. A. (2014). Systematic review of the check-in, check-out intervention for students at risk for emotional and behavioral disorders. *Education and Treatment of Children, 37*(4), 635–658. doi:10.1353/etc.2014.0030

Hawken, L. S., & Johnston, S. S. (2007). Preventing severe problem behavior in young children: The Behavior Education Program. *Journal of Early and Intensive Behavior Interventions, 4*(3), 599–613.

Hawken, L. S., MacLeod, K. S., & Rawlings, L. (2007). Effects of the Behavior Education Program (BEP) on office discipline referrals of elementary school students. *Journal of Positive Behavior Interventions, 9*(2), 94–101.

Hawken, L. S., O'Neill, R. E., & MacLeod, S. (2011). An investigation of the impact of function of problem behavior on effectiveness of the Behavior Education Program (BEP). *Education and Treatment of Children, 34*(4), 551–574. doi:10.1353/etc.2011.0031

Hintze, J. M., & Matthews, W. J. (2004). The generalizability of systematic direct observations across time and setting: A preliminary investigation of behavioral observation. *School Psychology Review, 33*(2), 258–270.

Horner, D. R., & Baer, D. M. (1978). Multiple-probe techniques: A variation of the multiple baseline. *Journal of Applied Behavior Analysis, 11*, 189-196.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence based practice in special education. *Exceptional Children, 71*(2), 165–179.

Hunter, K. K., Chenier, J. S., & Gresham, F. M. (2014). Evaluation of check in/check out for students with internalizing behavior problems. *Journal of Emotional and Behavioral Disorders, 22*(3), 135–148. doi:10.1177/1063426613476091

Hunter-Carsch, M., Tiknaz, Y., Cooper, P., & Sage, R. (Eds.) (2006a). Creating supportive adult–student and peer relationships. In *The handbook of social, emotional and behavioral difficulties* (pp. 113–133). London, United Kingdom: Continuum International.

Hunter-Carsch, M., Tiknaz, Y., Cooper, P., & Sage, R. (Eds.) (2006b). Overview of problems and issues in serving students with emotional and behavior disorders in school settings. In *The handbook of social, emotional and behavioral difficulties* (pp. 3–31). London, United Kingdom: Continuum International.

Individuals With Disabilities Education Act, 20 U.S.C. § 1400 *et seq*. (2006). Retrieved

from http://idea.ed.gov/download/finalregulations.pdf

Jenson, W. R., & Reavis, H. K. (1996). Home notes to improve motivation. In H. K. Reavis, M. T. Sweeten, W. R. Jenson, D. P. Morgan, D. J. Andrews, & S. Fister (Eds.), *Best practices: Behavioral and educational strategies for teachers* (pp. 29–39). Longmont, CO: Sopris West.

Jenson, W. R., Rhode, G., & Reavis, H. K. (2009). *The tough kid tool box*. Eugene, OR: Pacific Northwest.

Jenson, W. R., & Sprick, M. S. (2014). *The tough kid: On-task in a box.* Eugene, OR: Pacific Northwest.

Kazdin, A. E., & Kopel, S. A. (1975). On resolving ambiguities of the multiple-baseline design: Problems and recommendations. *Behavior Therapy, 6*(5), 601–608.

Kern, L., Choutka, C. M., & Sokol, N. G. (2002). Assessment-based antecedent interventions used in natural settings to reduce challenging behavior: An analysis of the literature. *Education and Treatment of Children, 25*(1), 113–130.

King, B., Radley, K. C., Jenson, W. R., Clark, E., & O'Neill, R. E. (2014). Utilization of video modeling combined with self-monitoring to increase rates of on-task behavior. *Behavioral Intervention, 29*, 125–144. doi:10.1002/bin.1379

Knorr, J. (2015). *A validation and efficacy study examining the electronic home note intervention package for increasing rates of on-task and academic performance* (Unpublished doctoral dissertation). University of Utah, Salt Lake City, Utah.

Kottler, J. A. & Kottler, E. (2009). *Students who drive you crazy: Succeeding with resistant, unmotivated, and otherwise difficult young people*. Thousand Oaks, CA: Corwin Press.

Kraemer, E. E., Davies, S. C., Arndt, K. J., & Hunley, S. (2012). A comparison of the Mystery Motivator and the Get 'Em On Task interventions for off-task behaviors. *Psychology in the Schools, 49*(2), 163–175. doi:10.1002/pits.20627

Lahey, B. B., Gendrich, J. G., Gendrich, S. I., Schnelle, J. F., Gant, D. S., & McNees, M. P. (1977). An evaluation of daily report cards with minimal teacher and parent contacts as an efficient method of classroom intervention. *Behavior Modification, 1*(3), 381–394.

Lane, K. L., Capizzi, A. M., Fisher, M. H., & Ennis, R. P. (2012). Secondary prevention efforts at the middle school level: An application of the Behavior Education Program. *Education and Treatment of Children, 35*(1), 51–90. doi:10.1353/etc.2012.0002

LeBel, T. J., Chafouleas, S. M., Britner, P. A., & Simonsen, B. (2012). Use of a daily report card in an intervention package involving home-school communication to

reduce disruptive behavior in preschoolers. *Journal of Positive Behavior Interventions, 15*(2), 103–112. doi:10.1177/1098300712440451

Lee, M., & Levins, M. (2012). *Bring your own technology: The BYOT Guide for Schools and Families*. Camberwell, Vic., Australia: ACER Press.

Lehr, C. A., Sinclair, M. F., & Christenson, S. L. (2004). Addressing student engagement and truancy prevention during the elementary school years: A replication study of the Check & Connect model. *Journal of Education for Students Placed at Risk, 3*, 279-301.

Lopach, L. (2016). *The electronic daily school note: A study examining an evidence-based school intervention package for improving on-task behavior, academics, and home-school collaboration.* (Doctoral dissertation). University of Utah, Salt Lake City, Utah.

MacSuga-Gage, A. S., & Simonsen, B. (2015). Examining the effects of teacher-directed opportunities to respond on student outcomes: A systematic review of the literature. *Education and Treatment of Children, 38*(2), 211–239. doi:10.1353/etc.2015.0009

Maggin, D. M., Chafouleas, S. M., Goddard, K. M., & Johnson, A. H. (2011). A systematic evaluation of token economies as a classroom management tool for students with challenging behavior. *Journal of School Psychology, 49*, 529–554. doi:10.1016/jsp.2011.05.001

Maggin, D. M., Johnson, A. H., Chafouleas, S. M., Ruberto, L. M., & Berggren, M. (2012). A systematic evidence review of school-based group contingency interventions for students with challenging behavior. *Journal of School Psychology, 50,* 625–654. doi:10.1016/jsp.2012.06.001

Maggin, D. M., Zurheide, J., Pickett, K. C., & Baillie, S. J. (2015). A systematic evidence review of the check-in/check-out program for reducing student challenging behaviors. *Journal of Positive Behavior Interventions, 17*(4), 1–12.

Marsh, S. (2015, January 27). Five top reasons people become teachers and why they quit. *Guardian*. Retrieved from https://www.theguardian.com/teacher-network/2015/jan/27/five-top-reasons-teachers-join-and-quit

Marzano, R. J. (2003). The critical role of classroom management. In *Classroom management that works: Research-based strategies for every teacher* (pp. 1–12). Alexandria, VA: Association for Supervision & Curriculum Development.

Maynard, B. R., Kjellsrand, E. K., & Thompson, A. M. (2014). Effects of check and connect on attendance, behavior, and academics: A randomized effectiveness trial. *Research on Social Work Practice, 24*(3), 296–309. doi:10.1177.1049731513497804

McCurdy, B. L., Kunsch, C., & Reibstein, S. (2007, Spring). Secondary prevention in the urban school: Implementing the Behavior Education Program. *Preventing School Failure, 51*(3), 12–19.

McDaniel, S. C., & Bruhn, A. L. (2015). Using a changing criterion design to evaluate the effects of check-in/check-out with goal modification. *Journal of Positive Behavior Interventions*, 1–12. doi:10.1177/1098300715588263

McIntosh, K., Campbell, A. L., Russell Carter, D., & Zumbo, B. D. (2009). Concurrent validity of office discipline referrals and cut points used in schoolwide positive behavior support. *Behavioral Disorders, 34*(2), 100–113.

Miller, L. M., Dufrene, B. A., Olmi, J., Tingstrom, D., & Filce, H. (2015). Self-monitoring as a viable fading option in check-in/check-out. *Journal of School Psychology, 53*, 121–135. doi:10.1016/j.jsp.2014.12.004

Miller, L. M., Dufrene, B. A., Sterling, J. E., Olmi, J., & Bachmayer, E. (2015). The effects of check-in/check-out on problem behavior and academic engagement in elementary school students. *Journal of Positive Behavior Interventions, 17*(1), 28–38.

Miranda, H. P., & Russell, M. (2012). Understanding factors associated with teacher-directed student use of technology in elementary clasrooms: A structural equation modeling approach. *British Journal of Educational Technology, 43*(4), 652–666. doi:10.1111/j.1467-8535.2011.01228.x

Mitchell, B. S., Stormont, M., & Gage, N. A. (2011). Tier two interventions implemented within the context of a tiered prevention framework. *Behavioral Disorders, 36*(4), 241–261.

Murphy, J. J. (1988). Contingency contracting in schools: A review. *Education and Treatment of Children, 11*(3), 257–269.

No Child Left Behind Act of 2001, 20 U.S.C. § 6301 *et seq*. (2006). Retrieved from https://www2.ed.gov/policy/elsec/leg/esea02/index.html

Oliver, R. M., Wehby, J. H., & Reschly, D. J. (2011). Teacher classroom management practices: Effects on disruptive or aggressive student behavior. *Campbell Systematic Reviews.* doi:10.4073/csr.2011.4

Owens, J. S., Holdaway, A. S., Zoromski, S. W., Himawan, L. K., Girio-Herrera, E., & Todd, A. W., . . . Horner, R. H. (2012). Incemental benefits of a Daily Report Card intervention over time for youth with disruptive behavior. *Behavior Therapy, 43*, 848–861.

Parker, R. I., Vannest, K. J., & Brown, L. (2009). The improvement rate difference for single-case research. *Exceptional Children, 75*(2), 135–150.

Parker, R. I., Vannest, K. J., & Davis, J. L. (2011). Effect size in single-case research: A review of nine nonoverlap techniques. *Behavior Modification, 35*(4), 303–322.

Parker, R. I., Vannest, K. J., Davis, J. L. & Sauber, S. B. (2011). Combining nonoverlap and trend for single-case research: Tau-U. *Behavior Therapy, 42,* 284–299.

Pas, E. T., Bradshaw, C. P., & Mitchell, M. M. (2011). Examining the validity of office discipline referrals as an indicator of student behavior problems. *Psychology in the Schools, 48*(6), 541–555. doi:10.1002/pits.20577

Pearson, Inc. (2012). *Aimsweb: Mathematics computation administration and scoring guide*. Retrieved from http://www.aimsweb.com

Polirstok, S., & Gottlieb, J. (2006). The impact of positive behavior intervention training for teachers on referral rates for misbehavior, special education evaluation and student reading achievement in the elementary grades. *International Journal of Behavior Consutlation and Therapy, 2*(3), 354–361.

Provini, C. (2014). Why are teachers leaving the profession? *Education World*. Retrieved from http://www.educationworld.com/a_curr/why-are-teachers-leaving-profession.shtml

Reynolds, C. R., & Kamphaus, R. W. (2015). *Behavior Assessment System for Children, Third Edition, Teacher Rating Scale*. Retrieved from www.pearsonclinical.com/education/products/100001402/behavior-assessment-system-for-children-third-edition-basc-3.html?cmpid=300219-PPC-BASC3#tab-details

Rhode, G., Jenson, W. R., & Reavis, K. (2010*). The tough kid book: Practical classroom strategies* (2nd ed.). Eugene, OR: Pacific Northwest.

Riley-Tillman, T. C., Christ, T. J., Chafouleas, S. M., Boice-Mallach, C. H., & Briesch, A. (2011). The impact of observation duration on the accuracy of data obtained from direct behavior rating (DBR). *Journal of Positive Behavior Interventions, 13(2),* 119–128.

Rogers, J. L., & Nicewander, W. A. (1988). Thirteen ways to look at the correlation coefficient. *American Statistician, 42*(1), 59–66.

Ross, S. W., & Sabey, C. V. (2015). Check-in check-out + social skills: Enhancing the effects of check-in check-out for students with social skills deficits. *Remedial and Special Education, 36*(4), 246–257. doi:10.1177/0741932514553125

Royer, E. (2006). SEBD students and teachers' training: A knowledge base is in search of practitioners. In M. Hunter-Carsch, Y. Tiknaz, P. Cooper, & R. Sage (Eds.), *The handbook of social, emotional and behavioral difficulties* (pp. 30–35). London, United Kingdom: Continuum International.

Shapiro, E. S., & Heick, P. F. (2004). School psychologist assessment practices in the evaluation of students referred for social/behavioral/emotional problems. *Psychology in the Schools, 41*(5), 551–561. doi:10.1002/pits.10176

Sinclair, M. F., Christianson, S. L., Evelo, D. L., & Hurley, C. M. (1998). Dropout prevention for youth with disabilities: Efficacy of a sustained school engagement procedure. *Exceptional Children, 65*(1), 7-21.

Sinclair, M. F., Christianson, S. L., & Thurlow, M. L. (2005). Promoting school completion of urban secondary youth with emotional or behavioral disabilities. *Council for Exceptional Children, 71*(4), 465–482.

Sinclair, M. F., Thurlow, M. L., Christenson, S., & Evelo, D. (1995, December). Check and Connect partnership for school success: Dropout prevention and intervention project targeting middle school youth with learning disabilities and emotional/behavioral disorders at risk for dropping out of school. In H. Thorton (Ed.), *Staying in school: A technical report of three dropout prevention projects for middle school students with learning and emotional disabilities* [Technical Report], Special Education Programs (ED/OSERS). Washington, DC: ABC Projects. Retrieved from http://files.eric.ed.gov/fulltext/ED398674.pdf

Skinner, B. F. (1974). *About behaviorism*. New York: Knopf.

Snyder, T. D., & Dillow, S. A., & U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences. (2015, May). *Digest of education statistics 2013.* Retrieved from http://nces.ed.gov/pubs2015/2015011.pdf

Spear, C. F., Strickland-Cohen, M. K., Romer, N., & Albin, R. W. (2013). An examination of social validity within single-case research with students with emotional and behavioral disorders. *Remedial and Special Education, 34*(6), 357–370. doi:10.1177/0741932513490809

Stage, S. A., & Quiroz, D. R. (1997). A meta-analysis of interventions to decrease disruptive classroom behavior in public education settings. *School Psychology Review, 26*(3), 333–368.

Steed, E. A. (2011). Adapting the Behavior Education Program for preschool settings. *Council for Exceptional Children, 20*(1), 37–41.

Strauss, V. (2015, June 12). Why so many teachers leave and how to get them to stay. *Washington Post*. Retrieved from https://www.washingtonpost.com/news/answer-sheet/wp/2015/06/12/why-so-many-teachers-leave-and-how-to-get-them-to-stay/?utm_term=.ca5ed6fc39ee

Sugai, G., Sprague, J. R., Horner, R. H., & Walker, H. M. (2000). Preventing school violence: The use of office discipline referrals to assess and monitor school wide discipline interventions. *Journal of Emotional and Behavioral Disorders, 8*(2),

94–101.

Sun, R. C. F., & Shek, D. T. L. (2012). Student classroom misbehavior: An exploratory study based on teachers' perceptions. *Scientific World Journal, 2012*, 1–8. doi:10.1100*2012/208907

Todd, A. W., Campbell, A. L., Meyer, G. G., & Horner, R. H. (2008). The effects of a targeted intervention to reduce problem behaviors: Elementary school implementation of Check In-Check Out. *Journal of Positive Behavior Intervention, 10*(1). 46–55. doi:10.1177/1098300707311369

Turtura, J. E., Anderson, C. M., & Boyd, R. J. (2014). Addressing task avoidance in middle school students: Academic behavior check-in/check-out. *Journal of Positive Behavior Interventions, 16*(3), 159–167. doi:10.1177/109988300713484063

Utah State Office of Education. (2013). *Class size and pupil–teacher ratio report, SY2013*. Retrieved from http://www.schools.utah.gov/data/Reports/Class-Size/2013ClassSizeReport.aspx

Utah State Office of Education. (2015). *Student–teacher ratio and class size, SY2015*. Retrieved from http://www.schools.utah.gov/data/Reports/ClassSize/StateReport2015.aspx

Vannest, K. J., Burke, M. D., Payne, T. E., Davis, C. R., & Soares, D. A. (2011). Electronic progress monitoring of IEP goals and objectives. *Teaching Exceptional Children, 43*(5), 40–51.

Vannest, K. J., Burke, M. D., Sauber, S. B., Davis, J. L. & Davis, C. R. (2011). Daily behavior report cards as evidence based practice for teachers. *Beyond Behavior, 20*(2), 13–21.

Vannest, K. J., Davis, J. L., Davis, C. R., Mason, B. A., & Burke, M. D. (2010). Effective intervention for behavior with a daily behavior report card: A meta-analysis. *School Psychology Review, 39*(4), 654–672.

Vannest, K. J., Harrison, J. R., Temple-Harvey, K., Ramsey, L., & Parker, R. I. (2011). Improvement rate differences of academic interventions for students with emotional and behavioral disorders. *Remedial and Special Education, 32*(6), 521–534.

Vannest, K. J., & Ninci, J. (2015). Evaluating intervention effects in single-case research designs. *Journal of Counseling & Development, 93*, 403–411.

Vannest, K. J., Payne, T. E., Davis, C. R., & Soares, D. A. (2011). Electronic progress monitoring of IEP goals and objectives. *Teaching Exceptional Children, 43*(5), 40-51.

Volpe, R. J., & Fabiano, G. A. (2013). *Daily behavior report cards: An evidence based system of assessment and intervention.* New York: Guilford Press.

Walker, H. M., Ramsey, E., and Gresham, F. M. (2004a, Winter). Heading off disruptive behavior: How early intervention can reduce defiant behavior and win back teaching time. *American Educator*. Retrieved from http://www.aft.org/periodical/american-educator/winter-2003-2004/heading-disruptive-behavior

Walker, H. M., Ramsey, E., and Gresham, F. M. (2004b, Winter). How disruptive behavior escalates hostility and disorder, and how teachers can avoid it. American Educator. Retrieved from http://www.aft.org/periodical/american-educator/winter- 2003-2004/how-disruptive-students-escalate-hostility

Wang, M., & Eccles, J. S. (2013). School context, achievement motiviation, and academic engagement: A longitudinal study of school engagement using a multidimensional perspective. *Learning and Instruction, 28*, 12–23.

Washington State Institute for Public Policy. (2016, June). *Benefit–cost results for "check-in" behavior interventions.* Retrieved from www.wsipp.wa.gov/BenefitCost/ProgramPdf/521/Check-in-behavior-interventions

What Works Clearinghouse. (2011). *WWC intervention report: Children classified as having and emotional disturbance: Check & Connect*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved from http://ies.ed.gov/ncee/wwc/pdf/intervention_reports/wwc_checkconnect_102511.pdf

What Works Clearinghouse. (2015). *Updated WWC intervention report: Dropout prevention: Check & Connect*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved from http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=78

Wolfe, K. Pyle, D., Charlton, C. T., Sabey, C. V., Lund, E. M., & Ross, S. W. (2015). A systematic review of the empirical support for check-in/check-out. *Journal of Positive Behavior Interventions*, 1–15. doi:10.1177/1098300715595957

Yoder, P., & Symons, F. (2010). Interobserver agreement and reliability of observational variables. In P. Yoder & F. Symons, *Observational measurement of behavior* (pp. 159–182). New York: Springer.

Yong, M., & Cheney, D. A. (2013). Essential features of Tier 2 social–behavioral interventions. *Psychology in the Schools*, *50*(8), 844–861. doi:10.1002/pits.21710